INSIDE: 3DS MAX • MAYA • MODO • ZBRUSH • CINEMA 4D • BLENDER

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3DArtist

48

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PHOTOREAL 3D

Demystify tools and techniques to create your best-ever macro shots

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Discover how to smash objects using the RayFire plug-in with 3ds Max

Exposed: VFX on a budget

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Learn to animate a convincing strut for better characters

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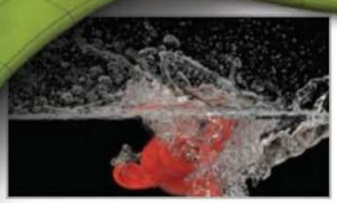
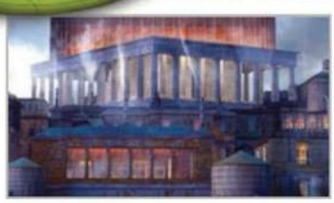


Make a splash!

Use free software to simulate and render photorealistic water effects



Post techniques

Add atmosphere to your arch-vis scenes with V-Ray and Photoshop

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Created for 3D Artist magazine by Kurt Papstein. www.3dartistonline.com

Artist info

Dmitry Denisov

Personal portfolio site
www.dmi3ryd.com

Location Moscow, Russia

Software used
modo, ZBrush, Photoshop

For many, the dream of achieving photorealism in our work feels like a distant one. So to help us break down the barrier is a fantastic tutorial by Dmitry Denisov.

Learn how to model objects, create maps, apply textures, work with materials and fur, add particles to your scene, light and render, and then composite everything in Photoshop for exceptional results. It's the full package!

> "I will demonstrate how to use Replicators [in modo] to create convincing water drops [and we'll] look at creating a real-world camera, setting up the focal length, aperture and [creating] bokeh effects"

Dmitry Denisov reveals the secrets behind his macro ladybird shot **Page 54**

With the Disc

Find a wealth of tutorial files plus an exclusive UVLayout software trial – Hobbyist version – for **3D Artist** readers, courtesy of headus

Perfect macro shots

Page 54

Welcome

to the magazine and 116 pages of amazing 3D

Every issue you can count on...

1. **116 pages of creative inspiration**
2. Behind-the-scenes guides to images and fantastic artwork
3. **A CD packed full of creative goodness**
4. Interviews with inspirational artists
5. **Tips for studying 3D or getting work in the industry**
6. The chance to see your art in the mag!

Whether you're working with environments or characters, realistic or stylised, we all share one ultimate goal: believability. We want to sell our ideas, to make our viewer truly believe that what we're showing them does or could exist.

This issue, we applaud those who've nailed the art of convincing 3D with a look at how Dmitry Denisov achieves photorealistic environment renders, plus a helping of tips from Gollum animator Paul Charisse to teach us how to add life to character expressions.

Our guide to convincing walk cycles will help you master a plausible strut, while bite-sized tutorials for Blender and CINEMA 4D will teach you the art of realistic splashes and water effects.

Enjoy the issue!

Lynette

This issue's team of expert artists...

Jahirul Amin

Our rigging and animation superhero is back this issue – go back to basics with J and learn to animate a convincing strut!

Adam Benton

Quench your thirst for CINEMA 4D with a quick tutorial to help you add condensation to a bottle of, mmmm, fizzy root beer.

Ross Board

High-five to Ross this issue for taking his stresses out on a few models. Watch him smash some screens with RayFire.

Paul Charisse

The ex-Weta Digital animator and director of *Stina & the Wolf* drops by to teach us a few of his tricks and reveal his new project.

Dmitry Denisov

Our star of the issue, Dmitry teaches us the art of photoreal 3D. A pleasure to work with, we hope he'll be back for more soon!

Paul Gaboury

After watching Paul's presentation at the Pixologic booth at SIGGRAPH 2012, we invited him to swing by to share a few tips.

Brendan Gibbons

Our expert Brendan checks out the new Smoke for Mac 2013. The trial is available till 31 December so grab it while it's free!

Roald Høyer-Hansen

Roald's enthusiasm for game-changing tools is always a hit with us – this issue he checks out Substance Designer 3.0.

Chris Kowal

Back to finish up his arch-vis scene from where we left off last issue, Chris teaches us the art of lighting, rendering and post.

Andrzej Kuziola

Andrzej is a dab hand at stylised illustrations with a traditional feel. His step-by-step guide using ZBrush reveals his secrets...

Filippo Veniero

When Filippo showed us what he was capable of in Blender last issue, we wanted him back. This issue, he makes a big splash!

Richard Yot

Luxology let Richard loose with the new NPR Kit for modo and we liked what we saw. This issue he teaches us a few of his tricks.

Sign up, share your art and chat to other artists at www.3dartistonline.com

3DArtist

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"We are attempting to use performance capture and CGI in a context I've not really seen it used in before"

Paul Charisse discusses the *Stina & the Wolf* animation project

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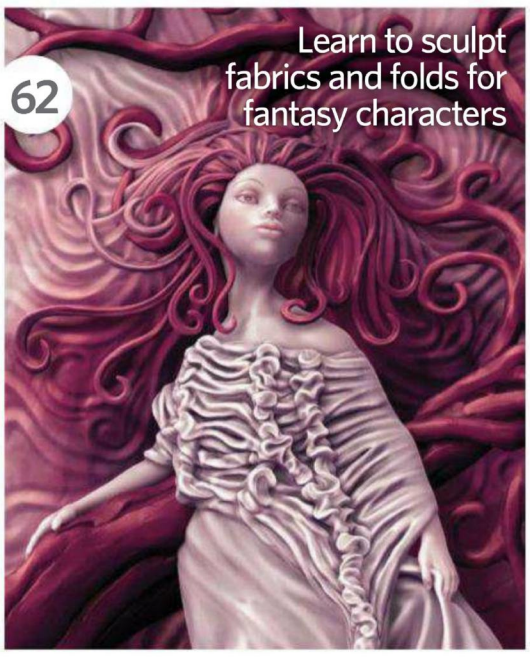

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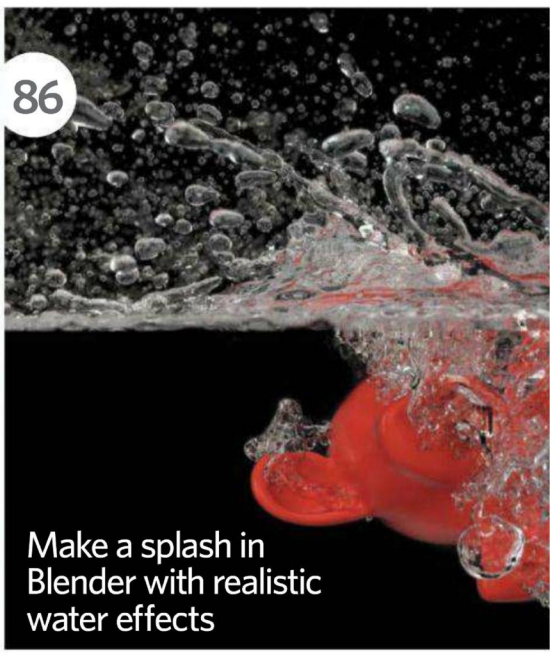
Learn to sculpt fabrics and folds for fantasy characters



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Make a splash in Blender with realistic water effects

3DArtist is now available on **iPhone & iPad**

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“We will discuss modelling techniques and topology, UV mapping and sculpting, texturing and applying Diffuse and Normal maps, lighting settings and the final post-processing of the image”

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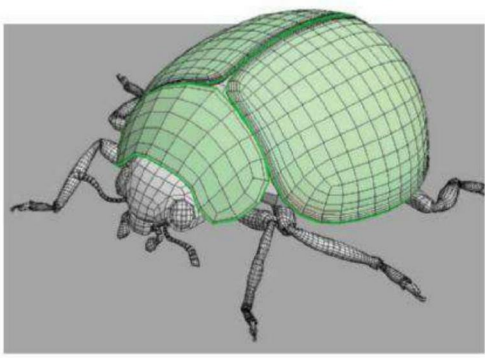

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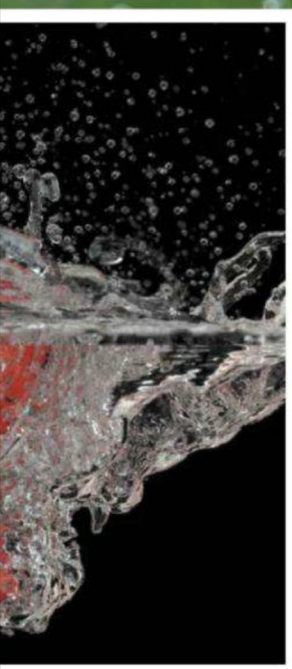

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Turn to page 112 for the complete list of the disc's contents

WELCOME TO

THE GALLERY

Seven pages of great artwork from the 3D community

Images we love!

The team Loves

"The atmosphere Alex has captured here is fantastic! He's managed to take us right back in time with his thoughtful approach to composition and lighting"

Lynette Deputy Editor

"Old things of this world, for me, have a special charm, especially automobiles. They look a little different to everything we have nowadays, so it's a perfect subject to illuminate in 3D. This car is a Duesenberg from 1929"

Alexandr Novitskiy, *1929 Duesenberg Model J Dual Cowl Phaeton,* 2012

Have an image you feel passionate about? Get your artwork featured in these pages

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Or get in touch... 3dartist@imagine-publishing.co.uk @3DArtist Facebook.com/3DArtistMagazine

Artist info

Alexandr Novitskiy

3DArtist online

Username: Tigersfather

Personal portfolio site
www.tigerfather.arttalk.ru

Country Ukraine

Software used
Maya, V-Ray, Photoshop

Work in progress...

> I misuse the tools for deformation rather than trying to achieve realistic results. This work is a result of experiments in [the] human body using the Fur system. [It was] exhibited in [the] Barcelona Mitte Gallery in December 2011

Can Pekdemir, *Untitled,* 2011

The team Loves

> It's always an exciting moment when you stumble across something really unique! We love the fine-art feel to this beautifully intriguing form

Lynette Deputy Editor

Artist info

Can Pekdemir

Can experiments with the deformation and abstraction of human and animal anatomy

Personal portfolio site
www.antrepo.org

Country Turkey

Software used
ZBrush, modo

Work in progress...

Artist info

Andrei Szasz

Andrei works as a senior character artist at Lionhead Studios in the UK

Personal portfolio site
www.andreiszasz.com

Country UK

Software used
3ds Max, V-Ray, ZBrush, Photoshop

Work in progress...

"I started this concept inspired largely by the *Mass Effect* style, but I also had *District 9* in mind... I used ZBrush for details and PolyPainting. I finished the textures using Photoshop and rendered a few passes using the V-Ray Frame Buffer"

Andrei Szasz, *Cpt. Kurk,* 2012

The team Loves

"Andrei has taken inspiration from several different sources but has very much made the finished product his own. This futuristic alien boasts its own sense of personality and character"

Chris News Editor

The team Loves

"This image just shows how powerful Blender can be in the hands of a skilled artist. The scene is bursting with dreamlike imagination!"

Chris News Editor

Artist info

Xavier Morteau

3DArtist online

Username: Xavmorteau

Personal portfolio site
www.xavmorteau.com

Country France

Software used
Blender

Work in progress...

"This image was created for the 3DVF contest – 'Alice In Your Own Imagination Land'. I wanted to picture Alice as a dreaming machine. The scene takes place at the end of the story, in the court, when the cards are jumping on Alice"

Xavier Morteau, *Fantasies Métalliques,* 2010

© Daniel Burgi

Artist info

Hasan Bajramovic

3DArtistonline

Username: hbajramovic

Personal portfolio site
www.hasanbajramovic.com

Country Bosnia & Herzegovina

Software used
ZBrush 4R4, 3ds Max 2011

Work in progress...

The team Loves

"The attention to detail here is incredible, from the impressive skin details down to the delicate feather and intricate ring. Absolutely stunning!"

Lynette Deputy Editor

"I was inspired [by the] classical paintings [of] Hans Holbein, a northern Renaissance artist. I was browsing through his work for days and felt the urge to create this artwork" **Hasan Bajramovic,** *Luciano,* 2012

Artist info

Seid Tursic

Seid designs and models characters for various projects at Inet Design, Sarajevo

Personal portfolio site
www.seid.cghub.com

Country Bosnia & Herzegovina

Software used
3ds Max, Photoshop, ZBrush

Work in progress...

The team Loves

"Seid's interpretation of Dickens' classic novel captures the character of Oliver Twist brilliantly, from the clothes he's wearing to the expression on his face"

Chris News Editor

"The work was completed for my personal character portfolio. I used the common tools in 3ds Max and ZBrush. Photoshop was used for background painting, colour correction and also compositing"

Seid Tursic, *Oliver Twist,* 2012

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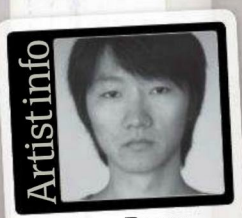

Artist info

RenPeng Dong

Personal portfolio site
www.oldrhyme.cgsociety.org
Country China
Software used
3ds Max, Maya, ZBrush, Mudbox, Photoshop, V-Ray

"I saw an image on a website that was like a kind of transparent man blending with his background, which brought me this great idea... [I] decided to show the feeling of part drying paint, part real, part plaster"

Non-US readers turn to page 98

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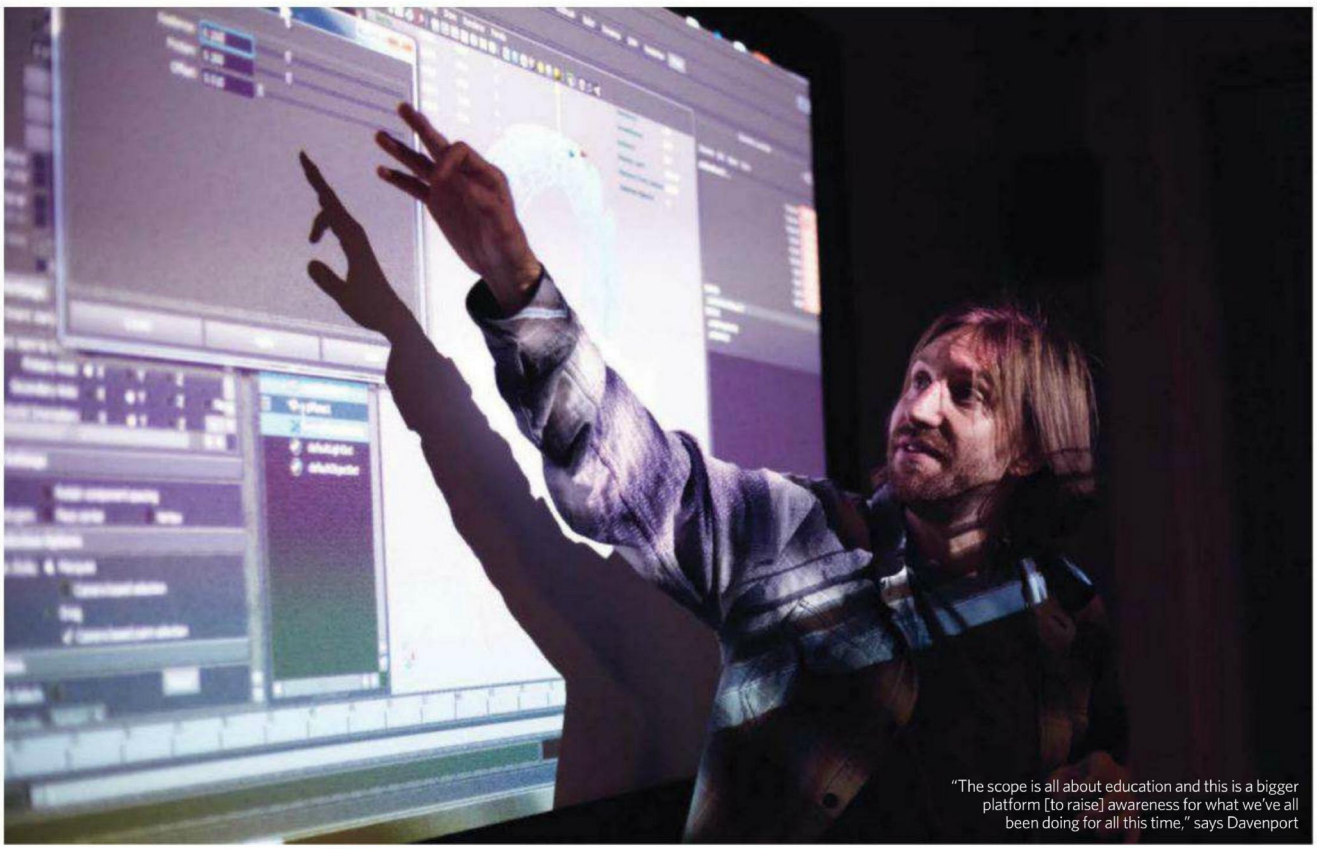


"The scope is all about education and this is a bigger platform [to raise] awareness for what we've all been doing for all this time," says Davenport

The UK's first VFX festival

Escape Studios' Dominic Davenport talks to **3D Artist** about The Visual Effects Festival, and how the event both celebrates and nurtures homegrown UK talent

October saw the UK's first-ever VFX festival take place in London, offering a unique perspective into the burgeoning UK visual-effects industry. Launched by Europe's leading VFX academy, Escape Studios, the inaugural festival gave attendees an insightful glance behind the scenes of the rapidly-evolving industry. It also bestowed up-and-coming artists with invaluable advice on what it takes to break into the world of VFX.

Industry luminaries embraced the opportunity to celebrate UK visual-effects excellence, with panels hosted by The Mill, Glassworks, Double Negative and Framestore, which included retrospectives on the special effects in films such as *Prometheus* and *Harry Potter*. "They welcomed it with open arms," said Escape Studios CEO Dominic Davenport on the festival's partnership with various VFX studios. "When we presented it to them they were delighted to get involved with something that celebrated what they do and helps make [the industry] more visible."

Speaking with 3D Artist on the eve of The VFX Festival's opening night, Davenport was eager for Escape Studios to continue the event on an annual basis. "I think the potential evolution would be to add a film festival element to the festival," he said. "[We want to] include short films, or maybe even student projects, something that really celebrates the emerging as well as the established talent."

> "I don't think many people are aware of the level of activity, expertise and world-leading companies that exist in this country"
>
> **Dominic Davenport,** founder of Escape Studios

What was the initial inspiration behind launching The Visual Effects Festival?

We've been nurturing talent for the digital-effects industry in the UK for the last ten years, but for the general public in the UK it's quite a hidden industry and I don't think many people are aware of the level of activity, expertise and world-leading companies that exist in this country. We wanted to showcase the excellence in the industry, and this provided the perfect vehicle for doing that. We're hoping to [hold the event] every year because it has been tremendously successful – it sold out in the first 36 hours. I think there's a real appetite for people discovering this content. I also think that for the UK to remain competitive in this globalised industry we need it to be as visible to the future generations as possible, so that they know this is a potential career opportunity, something that they can get involved with and apply themselves accordingly to start a career as a digital-effects artist.

Festival highlights

The festival played host to a versatile programme of workshops and presentations over four days. Here we highlight some of the most interesting topics presented at The Visual Effects Festival 2012...

HARRY POTTER TRIBUTE: FROM DOBBY TO KREACHER
Hosted by: Nico Scapel, Framestore
Working as head of rigging on a range of Hollywood blockbusters, Nico Scapel charted the VFX journey of *Harry Potter* and how both the films' effects and the industry have evolved during the franchise's growth.

RECRUITMENT PANEL DEBATE
Hosted by: Framestore, Double Negative, The Mill, Pixomondo and MPC Film
Leading names in the business hosted a panel discussing the best method to break into the VFX industry. They discussed how they individually carved a career in the competitive sector and gave advice to those looking for their big break.

THE HISTORY OF VFX
Hosted by: Matt Leonard, Sphere VFX
Head of training at Sphere VFX, Matt Leonard reflected on VFX over the years and the tools used to create some of the most impressive examples of 3D artistry.

THE EXPLOSIVE VFX OF PROMETHEUS
Hosted by: Nicola Danese, MPC
One of the most divisive films to be released in the past few years, *Prometheus* is perhaps better remembered as one of 2012's most visually-spectacular cinematic experiences. Lead FX TD Nicola Danese deconstructed the effects work on Ridley Scott's sci-fi epic.

SADDINGTON BAYNES LIVE DEMO
Hosted by: Saddington Baynes Automotive Creative Studio
Working closely with top European and international car brands, Saddington Baynes was in a great position to discuss how CGI has revolutionised automotive advertising across the world.

"It's about the excellence of the artists, programmers and TDs that have been working on these shows and the skill base in this country," says Escape Studios CEO Dominic Davenport

Image courtesy of Framestore and Warner Bros. Pictures

Are you surprised by the success of the festival?
Whenever you do something like this there's always trepidation. We knew there was interest because of the number of people who want to come study with us. The appetite for this type of content in general is pretty high and I think we were all pleasantly surprised when we found out the tickets had sold out.

Why hasn't anybody hosted a festival like this in the UK before?
I think there have been more commercial attempts. In the distant past there were things like The LEAF [The London Effects and Animation Festival] that existed ten years ago now. [That was] more about trade shows, selling hardware and software and the manufacturers of kit, than the people in the industry. I don't know why people haven't done it. Maybe they haven't seen it as necessary, I don't know really. But now we've got it I think it's something that we should keep pushing forwards with.

What type of audience has the festival attracted? Is it predominantly professionals, or is it amateurs hoping to break into the business?
The majority of the tickets sold have been to people who have nothing to do with [the industry]. So school children, people from college, hobbyists, filmmakers – all sorts of people in adjacent seats... Next year we could probably do something bigger and better that appeals to the industry as well. There's a contingent of tickets that we sold [to industry] people, but not the majority.

What does The Visual Effects Festival offer industry newcomers in terms of insight into practises?
[We provide] an introduction to the tools and the techniques that are used as well as [an explanation of the] working methodology, the types of projects and a breakdown of how things are produced. For a layman you can get really au fait with all of the technology and paraphernalia that sits around in the production process. There are also workshops that stand as introductions to the core principles of producing visual effects yourself.

What is your personal highlight of the festival?
The *Prometheus* screening and the *Harry Potter* tribute will be really good fun. We're seeing the evolution of *Harry Potter* from the first to the last in the series. It really shows the [progression] of the industry and the expertise as we become better and better at delivering these shows and the level of what's expected by the audience has evolved. The visual language and technology evolves alongside it. It's quite an interesting snapshot into the history of this industry.

If you like Wynia's *Cthulhu Rising*, you can purchase the sculpture on his website (**www.bryanwynia.blogspot.co.uk**)

3D Sketchbook

'Cthulhu Rising'

Character artist Bryan Wynia discusses the work behind his monstrous creation

Bryan Wynia www.bryanwynia.blogspot.co.uk

Attracted to the realm of the weird and wonderful from a young age, multimedia character artist Bryan Wynia's career has almost exclusively revolved around designing intriguing monsters. "The stories of HP Lovecraft are a huge inspiration," beams the artist. "I discovered his work when I was in high school and have been hooked ever since."

No surprise then that Wynia's pet project, *Cthulhu Rising,* was directly inspired by the author's original depiction of the mythical creature. "In Lovecraft's description... Cthulhu [is] an octopus, a dragon and a human caricature," explains Wynia. "I make it a point to gather reference before any project, so I started gathering images of vampire squids, various octopus species, alligator snapping turtles and frogs."

Using ZBrush 4R4 to render the beast, Wynia suggests the key to the sculpture is how it conveys a story. "As a sculptor, you should always consider yourself a storyteller," he says. "A compelling sculpture will carry your eyes throughout the entire image. A strong sense of rhythm and gesture are also keys to creating a sculpture with motion."

How Wynia established the daunting proportions of the mythical creature

For Wynia, conveying the Cthulhu's imposing scale was fundamental to the sculpture's success. "It was a major part of the story," he says. "Using the boat and rock really helped me describe the scale. The viewer has a general idea of how large a boat like this is, so seeing this massive vessel dwarfed by the beast really helps describe just how large Cthulhu is."

The online campaign raised $20,727 to fund the project

Kickstarter card game primed for big success

Tom Greenway explains the inception of 3DTotal's Prime Wars

Earlier this year publisher 3DTotal launched a Kickstarter campaign seeking $8,000 in pledges on the crowd-sourcing website to fund the strategic card battle game, *Prime Wars*. Using designs submitted for the publisher's *Prime V1* gallery book, each card features character art designed by one of 50 of the world's leading digital artists. "The game was kind of built in reverse," says managing director Tom Greenway. "We had an abundance of incredible images already, so we took our [favourites] and built the game around them.

"Without the *Prime* book and the draw of having your art in a fantastic art collection it would be impossible to get 50 of the world's leading digital artists to collaborate on a project like this," he adds. Visit www.3dtotal.com to learn more.

Masterpiece

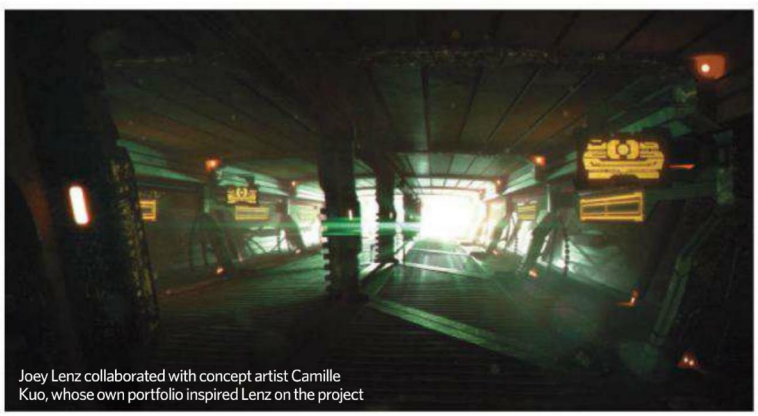
'Spaceship Corridor'

We talk to Joey Lenz about the creation of his desolate sci-fi vision

Joey Lenz www.polyplant.co

Evocative of filmmaker Ridley Scott's early exploits in blue-collar sci-fi films, Joey Lenz's haunting snapshot of a disquieting spaceship was conceived to elicit a strong reaction. "The first step for me was to figure out what kind of emotions [I wanted] to evoke from my viewers," remarks Lenz. "Everything about the piece was built around unsettling themes of mystery and abandonment. This was achieved through elements like lens distortion, an unknown bright backlight, flickering holographic displays, a slightly off-balance composition, a cheap-feeling, [dirty] camera with chromatic aberration... and a slow-moving pace through an unkempt environment."

Lenz used a combination of Maya, mental ray, Photoshop and NUKE to achieve the desired effect. He recommends the study of classical painters as a source of inspiration for other artists looking to achieve a similarly stirring vision. "No one can match the dramatic lighting rendered by the old masters," he remarks. "The more sources you can pull from, the better and more varied your work will be."



Joey Lenz collaborated with concept artist Camille Kuo, whose own portfolio inspired Lenz on the project

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NCCA Master's Degree Show

Bournemouth postgraduates show off their work at Framestore in London

The NCCA recently held its Masters Degree Show 2012 at Framestore in London, showcasing recent work crafted by the postgraduates on such courses as MA 3D Computer Animation and MA Digital Effects. "It's really important to hold these events so that the students can get to meet people from the industry in their own backyard, as it were," says Jon Macey, senior lecturer in Computer Animation at the NCCA. "We also hold our annual Industry Advisory Board at the same time so staff can talk to people from animation, film, effects and games companies about our plans and how well our curriculum fits into the needs of the modern industry. This year we had representatives from most of the major UK animation companies as well as a number of games companies." Find out more about the NCCA at http://ncca.bournemouth.ac.uk.

The technical side of the NCCA masters programs is often as interesting as the visual, with many students writing tools from scratch. You can learn more at **tinyurl.com/NCCAtechnical**

Inspiration corner

'Time Machine'

Aleksandr Kuskov explains transforming an everyday item into a captivating image

Aleksandr Kuskov http://revision.ru/a/AleksCG

Discovered rusting away in his own home, artist Aleksandr Kuskov re-envisioned an aging typewriter as a fantastical sci-fi machine and set about reinvigorating the object to aid the development of his modelling and visualisation skills. "[I] accidentally found it in a basket and wanted to revive it," says Kuskov. "[I wanted] to look at an object from a different point of view."

Kuskov specialises in augmenting physical objects with visual effects elements, using a combination of Maya, mental ray and Photoshop. With his *Time Machine* render, it was an opportunity to imbue the original device with a mystical ambience, using light refraction and carefully posed butterflies to suggest stillness in the image. "Reality has too many restrictions, but fantasy is boundless. Start making your fantasies, where anything is possible, come true," suggests Kuskov.

Transforming the original thick black frame into a translucent casing creates a startling sense of mystique

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3D printing

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Extreme Redesign 3D Printing Challenge

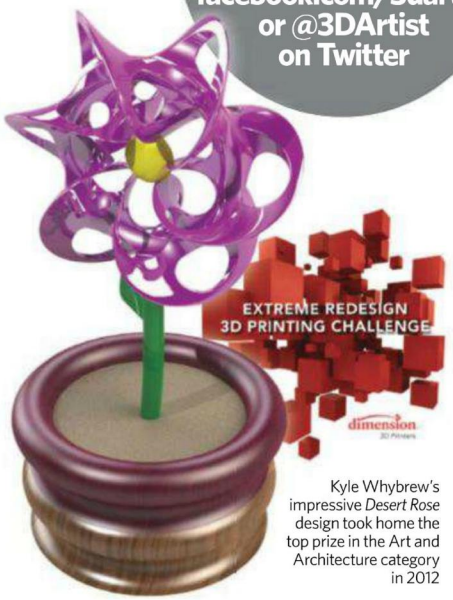
Stratasys' ninth annual Extreme Redesign 3D Printing Challenge is now underway, inviting students at college and university level to submit inventive new product designs, redesigns of existing products and original or redesigned works of art or architecture. Entrants have the chance of winning one of three scholarships.

2013 also sees the 3D printing competition introduce an exciting new incentive for university-level engineering entrants. Participants will have their designs judged by competition partner Edison Nation, which is a forum that matches inventors with manufacturers looking for commercial products to market. The most distinctive and commercial products submitted to the panel will be evaluated on their marketability and then considered for a licensing agreement.

Last year saw the $2,500 (approx £1,500) top prize in the University Engineering category won by Akshay Gautam and Gaurav Singh Jabalpur, whose robust hand pump was designed to supply continuous water during power outages.

"The contest offers students an engaging challenge that will put their creativity and critical-thinking skills to the test while giving them a chance at a scholarship," says Jesse Roitenberg, Stratasys education channel manager. "Every year we're impressed with the level of dedication students [give to] the designs they submit."

For more information on the competition, rules and how you can enter, head over to http://tinyurl.com/extremeredesign.



Kyle Whybrew's impressive *Desert Rose* design took home the top prize in the Art and Architecture category in 2012

Matthew Plummer-Fernandez pushes the boundaries of emerging 3D technology to create remarkable designs

Glitch Reality

The peculiar designs of Matthew Plummer-Fernandez

Unlike most artists, Matthew Plummer-Fernandez relishes imperfections. Riddled with rutted surfaces and jagged edges, his latest product *Glitch II* was created using a non-matching tea set scanned into a Z Corporation 3D scanner, before he roughly repaired the digital mesh files. Once printed, the tea set inherits all of the brilliant glitches from the analogue-to-digital-to-analogue translation, forming the uniquely captivating item. To see more of Matthew Plummer-Fernandez's extraordinary work, visit his portfolio page at www.plummerfernandez.com.

3D gun plans shot down

3D printers seized from company planning to develop gun manufacturing

The Defense Distributed site encourages a collaborative project to create available plans for 3D-printable guns

Defense Distributed recently found its plan to design and print handguns in the US halted as 3D printer supplier Stratasys withdrew its product from the company.

Defense Distributed raised $20,000 (£12,400) online to get the 'Wiki Weapon' project started and intended to share the blueprints for the printable 3D gun online, before 3D printer manufacturer Stratasys became aware of the site's intentions.

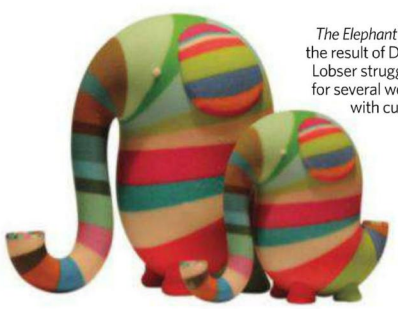
In a letter addressed to the company, Stratasys stated: "It is the policy of Stratasys not to knowingly allow its printers to be used for illegal purposes. Therefore please be advised that your lease of the Stratasys uPrint SE is cancelled at this time."

Currently a legal grey area in the US, this incident has raised questions as to how governments will react as 3D printing could be used for creating weapons across the world. It also presents a dark side to the otherwise creative and beneficial force that the technology presents.

Prints with flair

David Lobser discusses his vibrant creations on Shapeways

David Lobser has been working with 3D animation tools for 20 years and earned a living as a professional filmmaker for the last 12. Initially using 3D printing for creating props and creatures for animation, more recently he's been exploring his creative side by designing unique, vibrant and functional sculptures. "All this is to say, you have to make a lot of stuff before you can make anything really good," says Lobser. "One important trick is to keep your standards high, but not so high that they're out of reach. Making a good thing is one of the most wonderful experiences. If you give love to your art, and you stick with it through the tough times, the rewards are as boundless as your heart and your imagination." To see more of David Lobser's work, visit his Shapeways page at www.shapeways.com/shops/hilobster.



The Elephant was the result of David Lobser struggling for several weeks with curves

Created by Illusion Bangkok for JWT Shanghai
by Surachai Puthikulangkura. Rendered in modo®
with final touchup in Photoshop.

Luxology.com/modo/tour

create art in unexpected places

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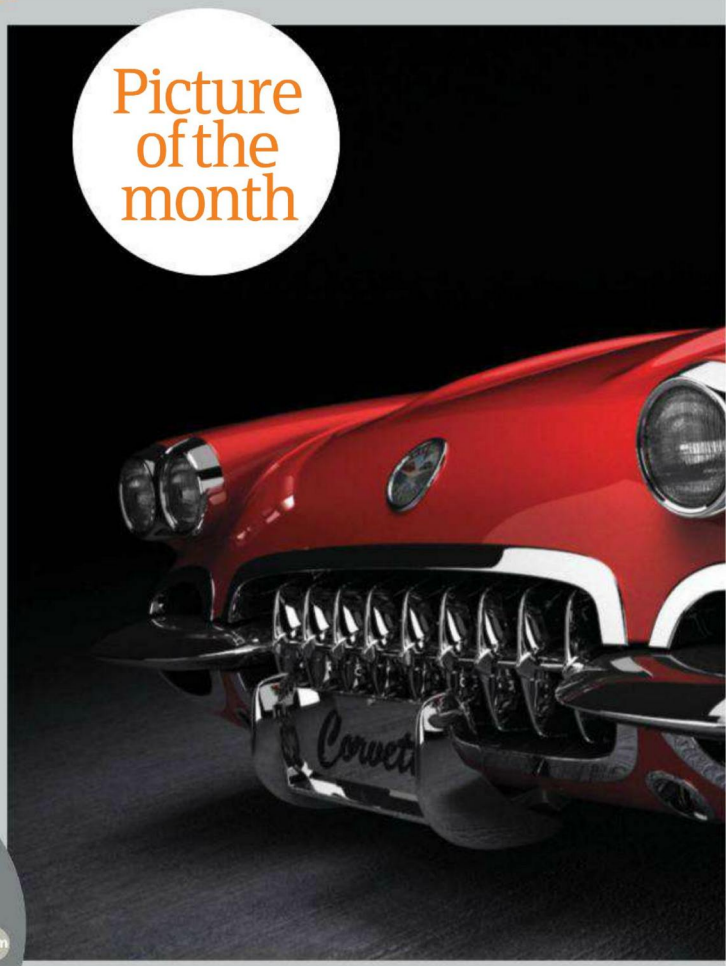

Picture of the month

Pictures of the week

THESE ARE THE IMAGES THAT WERE AWARDED PICTURE OF THE WEEK IN THE LAST MONTH

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www.3dartistonline.com
to view the art and chat to the artists

A 59 Chevrolet Corvette
» **Jeroen Van Hoorebeke**
Jeroen says: "This image was made for one of my 3D finals during my studies. I decided to rework it recently. I chose to model the 1959 Chevy Corvette because of its amazing curves and awesome grille!"
We say: "Turning the wheels inwards is the classic way to give your motor a great look in a studio shot. We also love the fantastic camera angle!"

B Fisherman's Friend
» **Jeroen Van Hoorebeke**
Jeroen says: "I'm very inspired by the sea and all that's around [it]: harbours, ships, people. This fascination was the source of inspiration for the *Fisherman's Friend*. High-poly modelled and sculpted, it was made with ZBrush, 3ds Max, V-Ray, Roadkill and Photoshop."
We say: "It's all in the eyes with this one! The classic portrait shot is kept simple, allowing the eyes to speak volumes. Congrats to Jeroen for his second victory!"

C Office 101
» **Oscar Juárez**
Oscar says: "The main idea was to create a cool and simple office at dawn, so me and my buddies CINEMA 4D and V-Ray did exactly that!"
We say: "The lighting is really beautiful here; the way it refracts through the glass table and streams across the floor perfectly describes a dawn setting."

D Furniture Still | Bath - General View
» **Alessandro Paolin**
Alessandro says: "Created in collaboration with Fotorama (the furniture photo studio)."
We say: "The shapes, textures and materials give this a certain retro feel, while the bathroom appliances are distinctly modern."

A

D

I Love Coffee!
» **Damian Machnik**
Damian says: "200 coffee beans modelled in 3ds Max and animated in reactor. Two hours of work."
We say: "Mmm, a lovely cup of steaming hot coffee – the froth is excellent, it looks good enough to slurp!"

Dr Drey
» **Peter Ang**
Peter says: "Done in ZBrush using BPR passes composited in Photoshop."
We say: "This colourful composition really brings the character to life – the implication of a busy city and streetlights enables us to instantly place this guy in his natural habitat."

Raid
» **Riyahd Cassiem**
Riyahd says: "*Raid* is a 3D character concept created using ZBrush for modelling and Photoshop for post effects. You can see more at: **http://riyahdart.blogspot.com/2012/09/raid.html**."
We say: "We love the gritty feel to this image. The forward-facing pose is particularly powerful when you can't see what eyes lie behind the mask. Creepy!"

Daegu Gosan Public Library
» **Cristian Chierici**
Cristian says: "Architectural visualisations for Deagu Gosa Public Library Competition. Team: Kim Hyun Seok, Alberto Casarotto, Linda Larice"
We say: "The post-production in this image is absolutely stunning – it takes a contemporary building and floods it with atmosphere and possibility."

Have your say

Email, Tweet or get in touch with us on Facebook to share your thoughts, opinions and proudest projects

You tell us

Facebook.com/3DArtistMagazine

So... Any thoughts on the Luxology>The Foundry merger? We're excited, but we're wondering what you all think!

Mohammed Issa: They might develop a full CG solution – at least that's my thought!

Stephen Mangold: Very interesting. I would think it can only be a good thing!

Read the news about the merger in this issue over on page 104

Get involved... @3DArtist

@max_25_uk: @3DArtist issue #46 Robot Special arrived just as we were starting our new guy so what do we think? pic.twitter.com/WcW8Ce0M.

@DanRoarty: @3DArtist magazine featuring *The Blue Project* as the cover has officially sold out! On to next project!

@3DArtist This morning we will mostly be super-excited about the #Luxology and #TheFoundry merger!! www.thefoundry.co.uk/articles/2012/09/25/415/the-foundry-and-luxology-q-and-as/ ... Thoughts, anyone?

Mike Griggs **@creativebloke** the game has been changed.

Star letter

digital-tutors

www.digital-tutors.com is a learning resource site boasting a library of 17,000 video-based CG lessons

THE AUTHOR OF THIS ISSUE'S STAR LETTER WINS A MONTH'S FREE SUBSCRIPTION TO DIGITAL-TUTORS WORTH $45

Too many software choices!

Hi there, I've been reading 3D Artist for a while now and have found it a huge help and a very interesting read. I'm a product designer based in Bournemouth... I'm fairly new to the 3D-artwork side of the industry so if I'm asking any silly questions I apologise!

Around a year ago I started my own company... I primarily use a CAD program called SolidWorks. It's an amazing program and has a decent rendering engine. My dilemma at the moment is SolidWorks is a very engineering-based design program and the products I'm working on professionally and personally are getting more complicated. For example, a big project I'm working on currently is a model of a human that is split into different sections – ie lower legs/shins, thighs, torso, arms and head... All my work has to be very accurate as it will be injection-moulded and manufactured [so] my big question is: Which program would be best for this type of work?

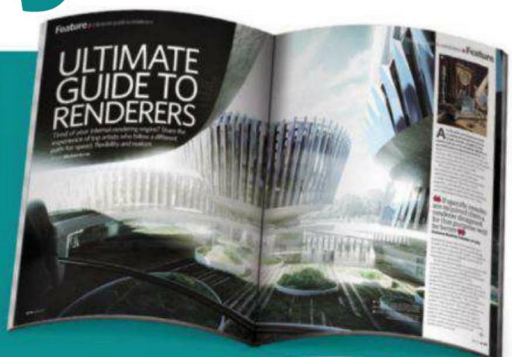
I have looked at 3ds Max and Maya, but have also read about ZBrush in your magazine. I have had a short go with each but I will pretty much be starting from scratch. Also: which rendering program/engine would be best? I was planning on using Maya but I am slightly confused by them all after reading your magazine.

Gino, via email

If you're used to working with SolidWorks then you might find modo a good option from Luxology – trial versions are available here: ***www.luxology.com/trymodo****. We hear from those new to 3D that modo is very user-friendly compared to the likes of 3ds Max and Maya. Here's some of the awesome work being created in modo to help encourage you:* ***www.luxology.com/gallery****.*

CINEMA 4D also has a simple, easy-to-use nature for those new to 3D software and is popular with those working in animation, motion graphics and broadcast: ***www.maxon.net/products/cinema-4d-studio/who-should-use-it.html****.*

As the winner of our Star Letter you've got a free one-month subscription to Digital-Tutors, which should time perfectly with the free trials so you can work out which is right for you. Best of luck!



Check out our ultimate guide to renderers in issue 41 and discover how to choose the best software with our feature in issue 43. Both are available now as back issues and digital versions through the Imagine Shop: **www.imagineshop.co.uk**

I want to go digital, but...

Hello, I just discovered the Zinio website and the low-cost digital magazine service that it provides. I noticed that 3D Artist is included in [its] selection. If I decide to use [its] service I will not receive the CD that is included with your magazine. Is there any way to acquire those CDs? Your magazine is rather expensive over here in the USA... Thanks

Bob, via email

Unfortunately we can't publish all of the content from each disc online for our digital-only readers, due to our agreements with suppliers and the need to protect their assets. However, all tutorials files are hosted online for our digital readers so they can follow along with the magazine. The tutorial files for each issue can be found here: ***www.3dartistonline.com/news/tutorial-files****. If you prefer print but want to save dollars and get your magazines quicker, check out our special US subs offer on page 15.*

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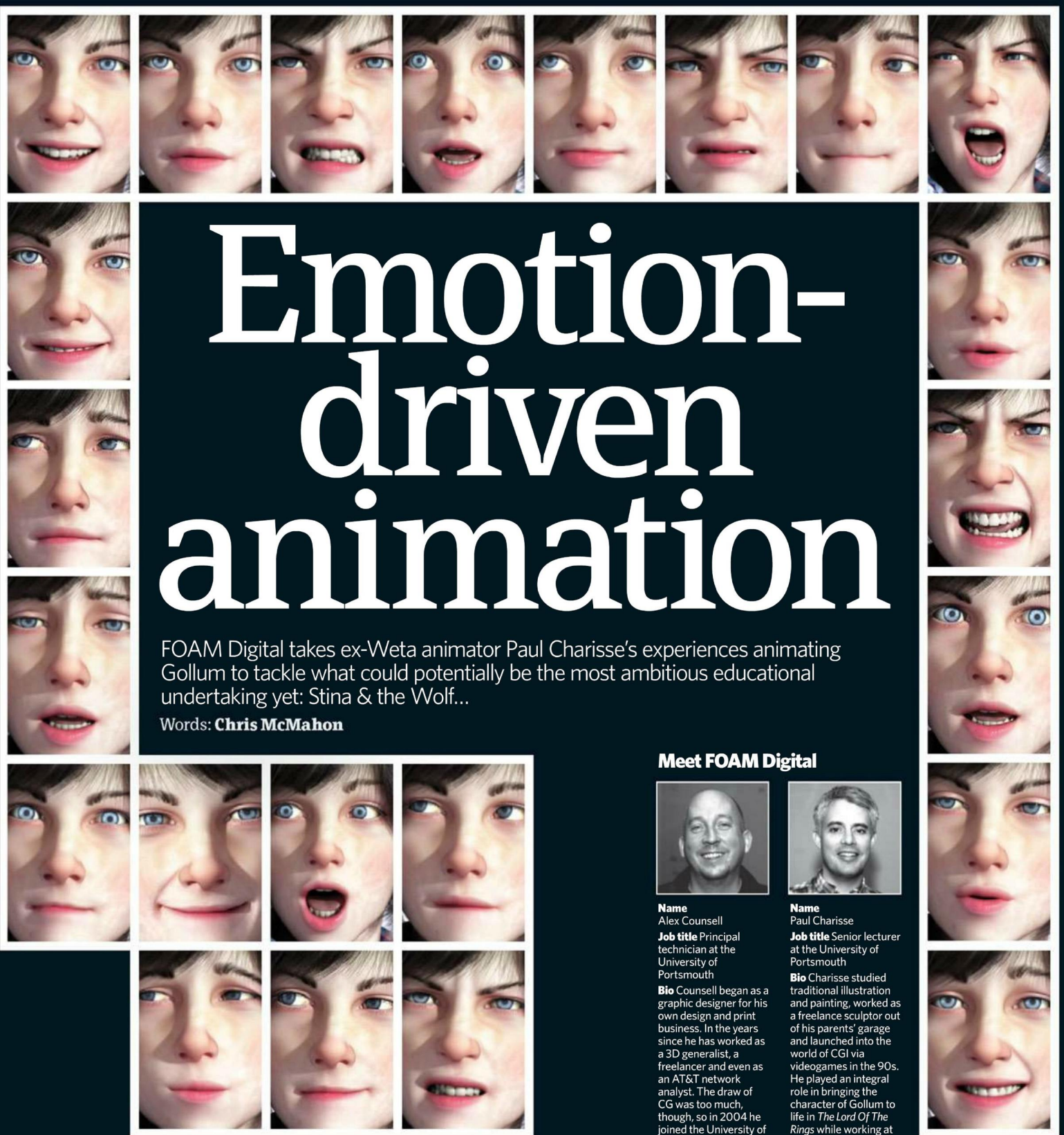


Emotion-driven animation

FOAM Digital takes ex-Weta animator Paul Charisse's experiences animating Gollum to tackle what could potentially be the most ambitious educational undertaking yet: Stina & the Wolf...

Words: **Chris McMahon**

Meet FOAM Digital

Name
Alex Counsell

Job title Principal technician at the University of Portsmouth

Bio Counsell began as a graphic designer for his own design and print business. In the years since he has worked as a 3D generalist, a freelancer and even as an AT&T network analyst. The draw of CG was too much, though, so in 2004 he joined the University of Portsmouth in a support role for the School of Creative Technologies. Although self-taught, he stresses the importance of a degree education.

Name
Paul Charisse

Job title Senior lecturer at the University of Portsmouth

Bio Charisse studied traditional illustration and painting, worked as a freelance sculptor out of his parents' garage and launched into the world of CGI via videogames in the 90s. He played an integral role in bringing the character of Gollum to life in *The Lord Of The Rings* while working at Weta Digital, developing his hugely impressive facial animation pipeline. Charisse became a lecturer at Portsmouth several years ago.

Emotion-driven animation

Here's a provocative question: does the current educational system for the CG industry fully prepare students for the high-pressure production processes of the industry? Do lectures and seminars properly ready students for the constantly-evolving pipelines and new challenges that a single working day can throw up? Is there room for improvement?

For Alex Counsell, principal technician at the University of Portsmouth, the answers to these questions don't come easy. "We talk a different language half the time," he reflects on the various differences between education and the CG industry. "Universities predominantly talk about *how* we teach, and the industry wants to talk about *what* we teach. We created FOAM Digital to tackle this."

A new and unprecedented approach to education that hopes to bridge the communicative gap between universities and the industry, FOAM Digital offers an innovative way to merge the how with the what. Operating on the grounds of the University of Portsmouth, the studio doesn't follow set curriculum templates, make students sit in workshops or take lessons on individual software applications. Rather, FOAM Digital is an adaptive, dynamic and fully operative studio environment modelled on the industry's top CG vendors. Students don't just learn the pipeline through presentations and slideshows, they *live* it.

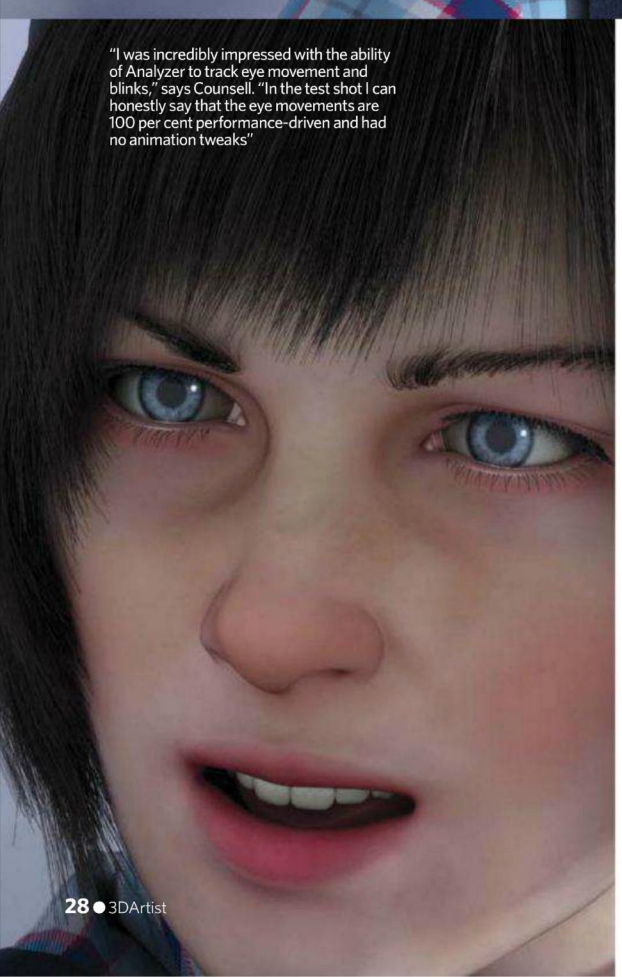
The first project to come out of this unique educational experiment couldn't be more ambitious if it tried. Headed up by ex-Weta Digital animator Paul Charisse, *Stina & the Wolf* is a feature-length film created entirely by staff and students on a not-for-profit basis. Not only that, but it's utilising professional facial-animation software capable of delivering performances in a manner that has rarely been seen before. We talk to the FOAM Digital team to find out how the project started out, and where it's going.

Stina & the Wolf

Emotion-driven animation

> My experience at Weta gave me the basic template of how I wanted FOAM Digital to run and how I saw the pipeline and departments evolving
>
> **Paul Charisse**

The actual details of *Stina & the Wolf*'s plot are being kept tightly under wraps, but it sounds like there's a great deal more to this project than initially meets the eye



"I was incredibly impressed with the ability of Analyzer to track eye movement and blinks," says Counsell. "In the test shot I can honestly say that the eye movements are 100 per cent performance-driven and had no animation tweaks"

Small beginnings

Before the idea of FOAM Digital was formed, *Stina & the Wolf* existed as the personal project of Charisse – a 25-minute CG short, similar in nature to the 1936 children's classic, *Peter and the Wolf*.

"The script took two years to develop and underwent quite a few revisions," remembers Charisse of Stina's early days. "It takes place in a world of mountains, where Stina lives in a brutal army town with her disabled uncle and unforgiving aunt. However, a troupe of feral gypsies arrive, led by a mysterious pipe-smoking war veteran. The ensuing festivities bring a contest that carries with it the threat of death to the boy she loves, and she is drawn into a story she can't resist..."

The setup is indeed intriguing, but even more so when you consider the sources from which Charisse has drawn inspiration: "A broad description of the production, and one we've been using as a kind of shorthand is: 'An Angela Carter short story, populated with characters from *Gregory's Girl*, with the dream logic of *Mulholland Drive* and the atmosphere of *Picnic at Hanging Rock* meets *Don't Look Now*'," he recounts, before taking a step back into far more recognisable cultural territory. "Having said all that, we also quite like *Star Wars*, so the film will hopefully be consumable as a [simple] adventure as well as contain something much darker and stranger."

As fate would have it, Charisse's ambitious alchemy of narrative proved too unwieldy to settle into a 25-minute running time. "After initial storyboarding I realised there were far too many ideas to explore effectively in a short," he admits. "I decided instead that it would be a great opportunity to develop a full-length feature film.

"[I consulted] a friend and fellow filmmaker Graeme Herwig about co-authoring a script, [as well as] work colleague Alex Counsell about the logistics involved in using it as a teaching exercise at the University of Portsmouth... It became clear that *Stina & the Wolf* was a perfect vehicle for our students to experience the kind of cutting-edge production pipeline I had been exposed to at Weta Digital, while working on *The Lord of the Rings*.

"We decided we should form a structured organisation that functioned like a visual effects studio – one that could go on to deliver a variety of additional film and VFX projects in the future." From this, FOAM Digital was born.

FOAM Digital's Weta-inspired VFX pipeline

A six-week shoot kicked the project off at FOAM Digital. During this time began the complex process of structuring the VFX side of the FOAM pipeline, using Weta Digital as a base model to set up the departments. Charisse explains:

Pre-vis

"We do all our pre-visualisation in Softimage, using our custom EGGHEAD rig, which is a simple jointed rig with a smooth head model on which we project the animated texture from our facial-capture cameras and the cleaned body mocap data. This allows us to frame, edit and direct the action like a regular film, reacting to the actors' close-up facial performances."

Modelling

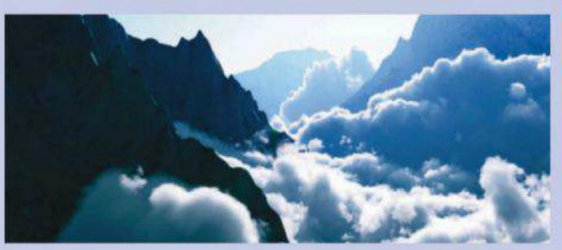
"For modelling we use Maya, 3ds Max and Softimage. We encourage the students to use whichever package they feel most confident in, as we teach all three. At present, all hard-surface models are made by the Modelling department, character bodies and faces by the Creatures department and plants, rocks and mountains by the Environments department."

Character pipeline

"Once the mocap is cleaned by our Mocap department, the data is brought onto our custom SNAPRIG, which snaps a weighted rig to an imported FBX file. Once fingers and faces and any further animation tweaks are done by Animation, we then bake out the point set data, which is then brought back into our dynamic rig where clothing and any other dynamic simulation is done by our Creatures department. We are presently building a muscle system, which we hope to include at this stage. We then bake out the final point data and bring it back into the render model that has all its shaders set up. It's then lit and rendered by our Lighting department. We are planning to rebuild some of this pipeline in the near future, using the new Alembic format and working within KATANA... This will make our look-dev and lighting design much easier to manage, particularly in much more complex scenes where we will be rendering multiple instanced objects through Arnold."

Environments

"We are using a mixture of ICE-based instancing and scatter procedures for generating natural systems, such as rocks, trees and plant placement. [We also use] Vue, which we are investigating for matte painting and cloud simulation."



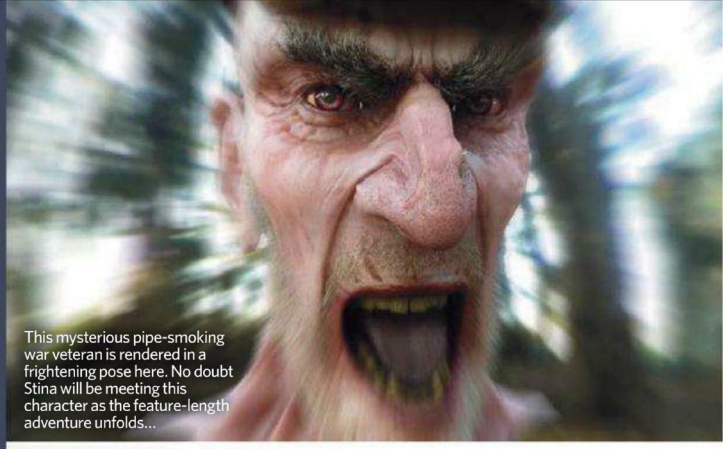
Dynamics

"For our dynamic pipeline we are using ICE in Softimage, which is proving very accessible for students and working well at solving a lot of simulation-based challenges. For cloth simulation we found Marvellous Designer 2 to be the best solution."

Compositing

"Our compositing pipeline is at a fairly early stage as we haven't generated enough content to push this to the limit yet... We are using NUKE and may look at deep compositing, as we have a few tricky shots that combine lots of different renders from a few different packages."

Emotion-driven animation



This mysterious pipe-smoking war veteran is rendered in a frightening pose here. No doubt Stina will be meeting this character as the feature-length adventure unfolds...

FOAM Digital's next-gen talent

Students at the University of Portsmouth discuss their experiences so far working on Stina & the Wolf project at FOAM Digital

Owyn Abraham

VFX & simulation lead "Working on Stina has been a huge boost to my personal work ethic, mentality and understanding of how an industry-standard project is achieved. The project has enabled me to decide what I want to do within the industry by [giving me] experience in how that role interacts and functions successfully in a production pipeline."

Razvan Arventiev

Lead 3D modeller "Working on the project has been a great experience. It has given me the chance to learn new things as well as be part of a professional team making a film. Because of this, we have been able to meet industry professionals and share our opinions with them. The experience on the movie will also be very helpful when we decide to apply for a job in the industry."

Natalie Curds

Creature lead "Being part of *Stina & the Wolf* is a great opportunity. I have learnt a lot that I wouldn't usually learn at university, especially from being the lead of a department, as well as having access to software we wouldn't usually use on our courses. We have been given a real taste of how [the] industry works."

Oliver Farnes

Senior VFX artist "The Stina project has been an opportunity to experience what it is like to work in a professional atmosphere on an industry-standard project. You don't usually get to take part in this kind of thing at university. Sometimes it can be really stressful meeting the weekly deadlines but the work really pays off in the end; it's a really exciting project to be a part of."

Adam Gardiner

Senior creature modeller & concept artist "Working on Stina provided some of the best learning experiences in my three years of university study. Getting involved in the Concept and Creature departments, at an industry standard, provided a great collaborative experience. This provides the kind of environment that encourages students to learn and excel – especially when the work is recognised by the industry."

Sian Gunningham

Senior VFX artist "I'm not going to lie, working through crunch time alongside the end-of-semester university deadlines has been a scary experience. However, being a part of Stina has been extremely rewarding [and] being able to see the result of our hard work knowing that we did that!"

Sam Hoffman

Environment lead "The project is an invaluable experience [for] us as students, because it gives us the opportunity to get involved in something of an industry standard, in both what gets produced and how. The pipeline is a prime example; as a lead in the film you really get to dive in at the deep end and figure it all out firsthand."

Thomas Lee

Animation lead "Stina has been really great to work on; it gives you constant goals to work towards. The pay-off when you see your work rendered at an industry level is a great boost of confidence that [you will be able to] get a job at the end of the degree."

Freya Spencer

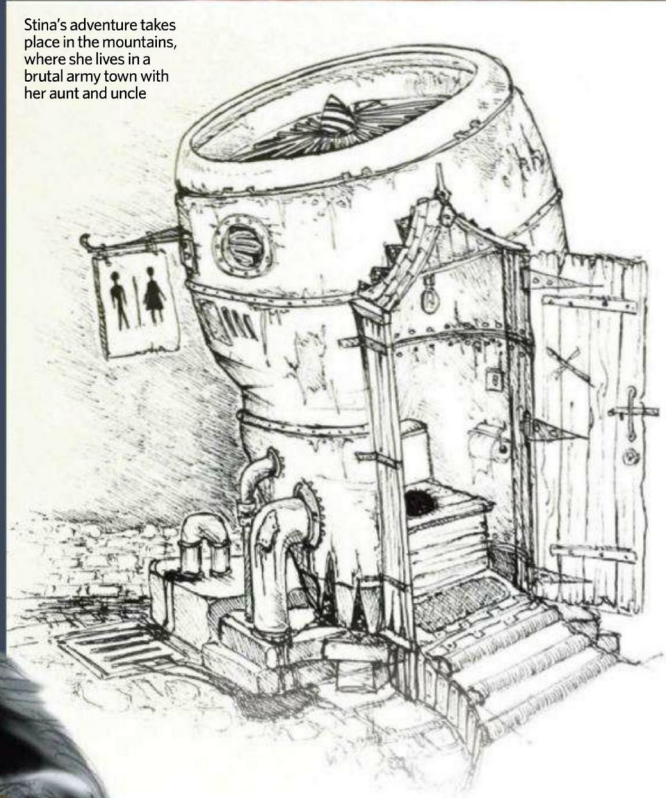
Junior animator "As a relatively inexperienced animator I was both nervous and excited to be a part of such an ambitious project. However, I now feel far more confident about how industry pipelines work, and the level of quality that needs to be achieved."

James Skillbeck

Shotgun lead "Working on *Stina & the Wolf* has been incredible! Nothing beats the feeling of seeing your work on the big screen! It has really helped me develop my skills and prepare to enter the industry."

Ben Vere

Lead motion editor "My team and I have gained a tremendous amount of experience being a part of this production environment, without even leaving the university while we do our degree. It has enabled myself and a few others to gain internships at The Imaginarium because of the skills we have learned. The only other thing I could hope for from the Stina project is more time!"

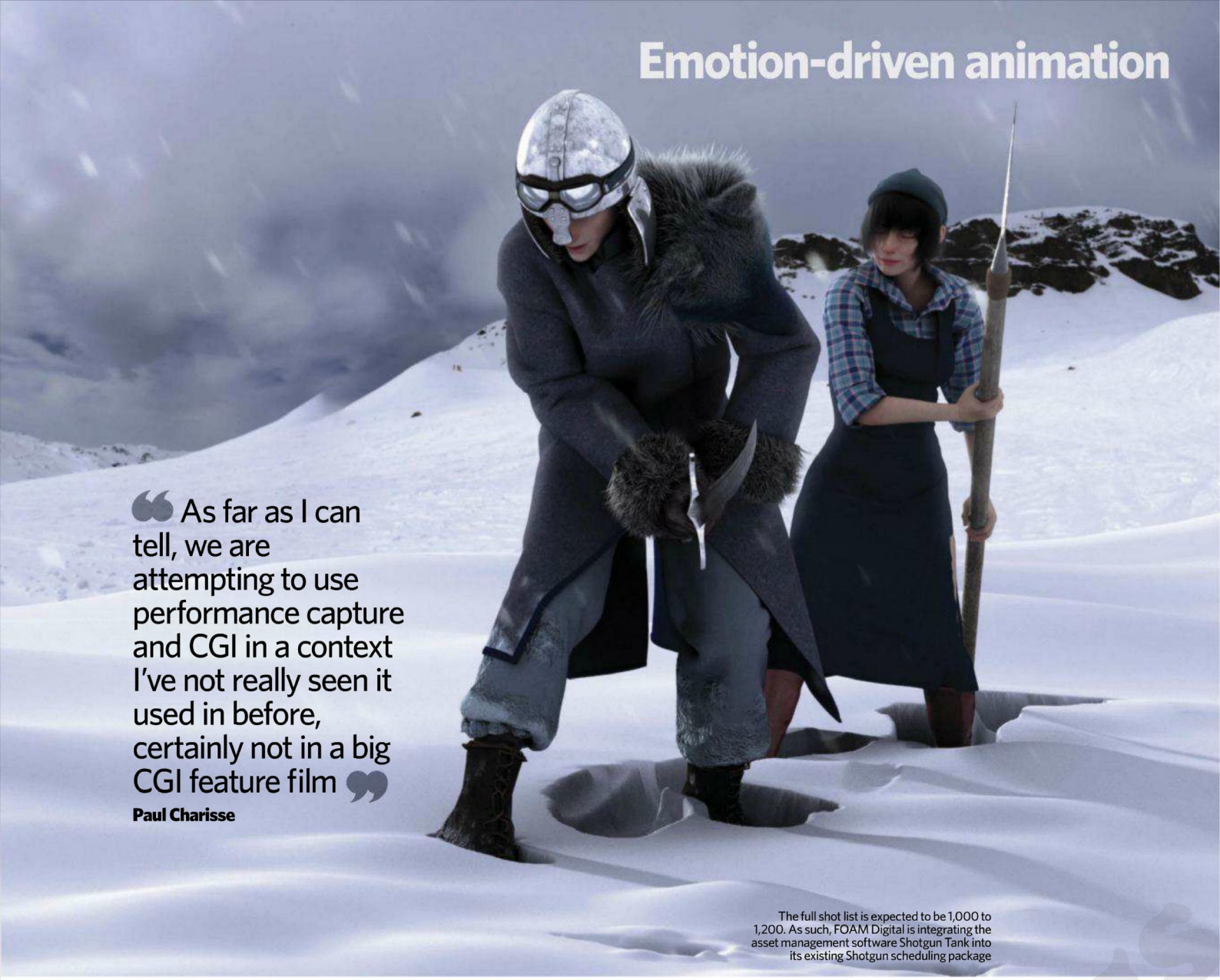


Stina's adventure takes place in the mountains, where she lives in a brutal army town with her aunt and uncle

+ Approaching education anew

Counsell, the man responsible for bringing FOAM Digital together, had been waiting for an opportunity like *Stina & the Wolf* to come along. "The idea of FOAM had been established for a while. We just needed a project to use as a kickstart to design our pipeline," he elaborates. "When Paul (Charisse) approached me with the idea for Stina and asked if the performance capture could be achieved at the university, it seemed the perfect fit. After all, if FOAM is to reach its potential then we have to start off in an ambitious way!"

Based within the Faculty of Creative and Cultural Industries at the University of Portsmouth, FOAM Digital has grown into a cutting-edge animation, visual effects and post-production facility. Its purpose is simple: to teach students high-end industry habits in such a way that they are employed in the real world, rather than through a strict, course-based curriculum.



> As far as I can tell, we are attempting to use performance capture and CGI in a context I've not really seen it used in before, certainly not in a big CGI feature film
>
> **Paul Charisse**

The full shot list is expected to be 1,000 to 1,200. As such, FOAM Digital is integrating the asset management software Shotgun Tank into its existing Shotgun scheduling package

"Universities generally run on a unitised system, where work is mostly delivered in self-contained, separate pieces, staggered over a three-year degree," says Charisse. "We thought it would be great if the project could run in parallel to the curriculum as an optional project; one that could span all three years and maybe even involve post-graduate and PhD students.

"We wanted it to function as a real-life industry experience that could hopefully get us engaging with the VFX industry on a production level that it could relate to."

Counsell has long been aware of the disparity between how students are taught and how they'll end up working. "It's very difficult to keep up with the demands of industry when you have to design a course and keep it consistent," he tells us. "Education cannot be as reactive as the industry can. Industry issues are very specific and our courses have to be broad to give the students that general understanding of an extremely diverse range of topics.

"That's one of the great things about FOAM: it can act in a way that is the same as the industry – changing its software, project duration or any other design aspects as and when it is needed – and offer a way of adopting current practices to run in parallel with our curriculum."

FOAM Digital and the Stina project do indeed pose an elective, voluntary endeavour, complementing the university curriculum rather than being embedded within the courses themselves. However, the potential for students eager to get involved is huge; the real-world production environment of FOAM Digital has been set up in response to feedback from the likes of The Moving Picture Company and Cinesite. More importantly, at Weta Digital Charisse was once himself an employee as animator on *The Lord of the Rings*' Gollum.

"My experience at Weta gave me the basic template of how I wanted FOAM Digital to run and how I saw the pipeline and departments evolving," says Charisse. "I clearly had my work cut out – I imagine many a wry smile from some of my more technical ex-colleagues upon discovering an animator was setting up a VFX pipeline, and I've had a fairly steep learning curve getting to grips with the various pipelines."

FOAM Digital now boasts many of the same departments as Weta Digital. "We have many of the same basic departments with the same basic functions and pipeline, albeit on a much more modest scale – very modest in some cases!" adds Charisse. "I felt we had the talent within the university to pull this off and that the potential student gain was massive. The industry pipeline experience, the chance to produce an actual feature-based showreel, and the industry involvement, all [feeds] back directly into [students'] courses... It's a great complement to the existing curriculum."

Emotion-driven animation

> “Faceware’s pixel-perfect tracking of the pupils, means eyes are actually our easiest mocap element”
> **Paul Charisse**

FOAM Digital has a large Concept department that works in both hand-drawn and computer-based media, producing characters, environments, objects, storyboards, shot visualisations and paintings

Emotive experience

It’s not just the setup of the studio that’s high-concept, but the creation of the project itself. Under the leadership of Charisse – who worked on the facial animation of Gollum in *The Lord of the Rings* – the *Stina & the Wolf* team has fully embraced the latest mocap and animation technology to ensure that the film delivers firm, believable and above all human performances from its cast for the CG characters.

“We wanted a complete performance capture of face and body,” remembers Charisse. “At this stage, we didn’t know what facial animation solution we were going to need, but my experience on *The Lord of the Rings* had shown me that if you at least have very good, locked-off facial reference, you could always animate frame by frame if you needed to.”

In order to keep the budget low, the students built four custom head-mounted cameras to record their facial performance. FOAM Digital then reached out to Faceware Technologies and its Analyzer and Retargeter software, selected for its student-friendly flexibility. Like many companies that partnered with the production, Faceware kindly offered the use of its software free of charge.

The results are stunning, with the actors’ performances transposed nearly flawlessly onto the characters’ faces. Early animations of Stina display humour, fear and conviction completely convincingly, immersing the viewer into the unfolding drama just as a live-action production would.

“The reality of the performance relates directly to our ability to translate the facial performance from the original acted version to our CG puppets,” says Charisse. “The faces are tracked using our custom, shed-built, facial cameras that provide mostly solid 30fps video. This video is then tracked and mapped onto our rigs using Faceware’s software.

“The Softimage facial rigs, meanwhile, have a lot of attention to detail around the eye area, including eyeball deformation of the eyelid flesh, additional shape deformation of the eyelids depending on which way they are looking, and an automated eyelid follow that can be overridden or added to by the studio’s Animation department.

“The quality of our video capture, combined with Faceware’s pixel-perfect tracking of the pupils, means eyes are actually our easiest mocap element,” continues Charisse. “For the rest of the facial muscles around the eyelid, mouth and nose we have Faceware data driving a combination shape system that’s based on *The Lord of the Rings*’ Gollum system and uses Paul Ekman’s FACS as a reference.”

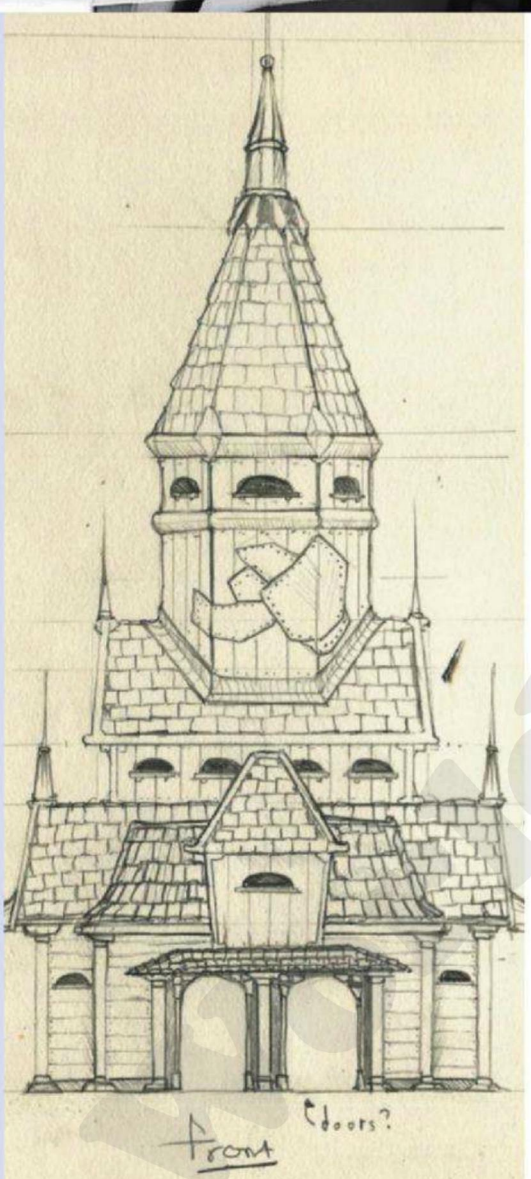
Emotion-driven animation

"We now have over 800 individual storyboard plates and hundreds of pieces of concept art to map out our journey as we transpose our performances into the CG realm," says Charisse

Stina & the Wolf

A number of other systems further drive the performance. "On top of Faceware we have assorted automated sticky lips systems and other averaging and smoothing operators to soften out the extremes of the combined muscle movements," explains Charisse. "We also have a method of modelling the initial facial shapes, which takes into account sliding skin. This helps a lot in the believability levels of the skin's elasticity and helps us retain a high degree of sculptural control – something much harder to do when you're just using cloth or dynamic skin simulation. We model the skin sliding by moving the topology along the surface normals as a final pass, once the basic muscle shape has been modelled. We teach this process on our animation courses, which means many of the students are already familiar with it."

It's also exciting to hear that FOAM Digital isn't just embracing the technology from a technical standpoint but also from an artistic perspective. Throughout the project the students have been using animation tricks to immerse the viewer further into Stina's strange, dreamlike world. "As far as I can tell we are attempting to use performance capture and CGI in a context I've not seen it used before," says Charisse. "We're pitching our film in the magical-realist genre, which seems perfect to me for CGI performance capture as it allows the filmmaker to exploit a tension between what is real and what is fake. From a character standpoint, we want to use and control the idea of the Uncanny Valley, using it for narrative reasons and not just as the inevitable result of bad animation."



Big industry names give their support

Although the main work is being undertaken by FOAM Digital's students and staff, they are not working independently. The studio has set up with eight major partners who have donated a whopping £500,000 worth of equipment and software to the production completely free of charge. These include:

Autodesk www.autodesk.com
Faceware Tech www.facewaretech.com
IKinema www.ikinema.com
Shoran Software www.shoran.de
Shotgun www.shotgunsoftware.com
Solid Angle www.solidangle.com
The Foundry www.thefoundry.co.uk
Vicon www.vicon.com

SHOTGUN Autodesk
THE FOUNDRY
FACEWARE TECHNOLOGIES INC
IKinema life in animation
VICON SOLIDANGLE
SHORAN SOFTWARE

> We hope that this will set a precedence for other institutes to embrace the challenges that the industry faces and incorporate them into the curriculum... [It] will help provide students with that all-important headstart
>
> **Alex Counsell**

The stunning *Stina & the Wolf* animated test shot can be viewed at **tinyurl.com/StinaTestShot**

There's a trailer for *Stina & the Wolf* due next year, which will enable FOAM Digital to show off the narrative and atmosphere of the film, but also act as a test bed for its evolving pipeline and asset management system

A promising future

Up to this point, FOAM Digital and the initial stages of the *Stina & the Wolf* project have proved a resounding success, but Charisse knows the hard work is still to come. "We have quite a challenge ahead to pull this all off," he admits, but remains confident. "On the performance-capture side, thanks to Faceware coming on board, some very keen and talented team members and some fantastic central performances captured on our excellent Vicon system, we have a good headstart. We also now have over 800 individual storyboard plates and hundreds of pieces of concept art to map out our journey as we transpose our performances into the CG realm."

Many environments and character assets are yet to be created, and full shot production isn't expected to commence for some months yet. The team has, however, completed an animated test shot, which is viewable at **http://tinyurl.com/StinaTestShot**. Created by two lecturers and 12 students over the course of four weeks, this prototype sequence is proof that FOAM Digital can reach and maintain the quality levels required. It's also enabled the FOAM Digital team to work through the majority of its pipeline, preparing the students for the next big milestone: the cinematic trailer.

The team is currently looking to get the finished film completed by the end of 2015, with various scenarios for completion in place based on various funding options inside and outside of the university. However it comes together, *Stina & the Wolf* is an exciting proposition – not just in terms of the film itself, which promises an intoxicating blend of imagination and technology, but also with regards to the future of 3D education.

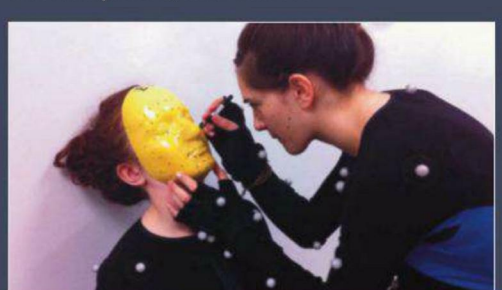
"We hope that [what we're doing] will set a precedence for other institutes to embrace the challenges that the industry faces and incorporate them into the curriculum," says a hopeful Counsell. "This will help to provide students with that all-important headstart that they need in a very competitive job market. Integrating the workflow and pipelines that we develop into teaching and the student experience is vital in keeping courses fresh and exciting."

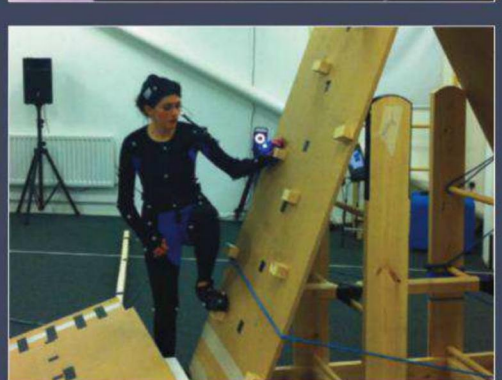
Paul is optimistic too. "It will also, hopefully, help promote a culture of independent feature-film making that could exist widely in the education sector," he beams. "Partly as a result of the developments in digital technology, we are all now at a stage where it is possible to make feature films in a university environment. Maybe the education sector could even push its way into the multiplexes one day..."

If it does, Stina will no doubt be held high as the pioneer of this determined push into a new brand of non-classroom-based education. We certainly can't wait to see what comes next.

The shoot

Pre-production on *Stina & the Wolf* started in July 2011, where over the space of two weeks staff and students built a custom stage, multiple set pieces and props while final rehearsals and read-throughs went on. Over the next five weeks the main performance-capture shoot took place and a total of 35 scenes were captured, involving 18 actors, up to six at a time, with four facial cameras and on-set audio recordings. The props and systems built ensured that FOAM Digital's mocap facility functioned just as one would in the real world. You can watch a video of week one of the shoot at **tinyurl.com/StinaTheShoot**.





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PRO TIPS AND TRICKS FOR CONVINCING EXPRESSIONS

After many years playing with faces for the film and game industries, Paul Charisse compiles his top tips to help you bring your own characters to virtual life

Words: **Paul Charisse**

The Pipe Catcher from *Stina & the Wolf*, rendered in Arnold. An animated example can be seen at: **http://youtu.be/WZ20AxrzY_c**

Our animation expert

Name Paul Charisse
Job role Senior lecturer
Location Portsmouth, UK
Expertise Character animation, modelling and rigging

2009 Senior lecturer in animation at Portsmouth University and director of CG feature film, *Stina & the Wolf*
2008 Animator at MPC on *The Chronicles of Narnia: Prince Caspian*
2007 Animator/3D artist at Double Negative on *Stardust*, *Harry Potter and the Order of the Phoenix* and *Hellboy II: The Golden Army*
2006 Developed a facial animation system for Lionhead Studios
2005 Animator/modeller at Peerless Camera on *Racing Stripes*, *The Brothers Grimm* and *The Legend of Zorro*
2001 Animator/Massive TD/modeller at Weta Digital, working on *The Lord of the Rings* trilogy

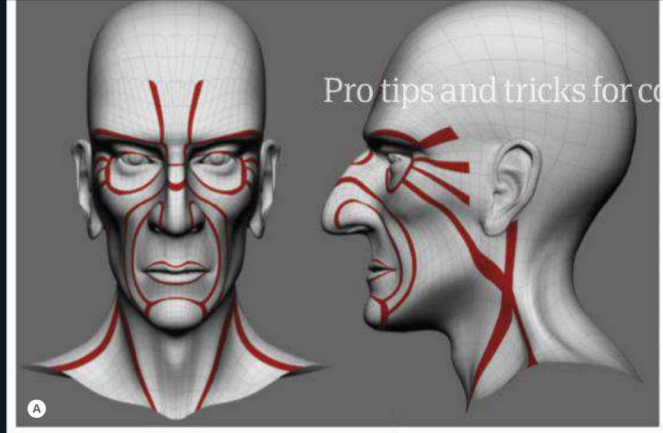
The key to effective facial animation, modelling and rigging is, simply put, observation. It's attention to detail, looking beyond the surface appearance and developing an understanding of the underlying forces at work.

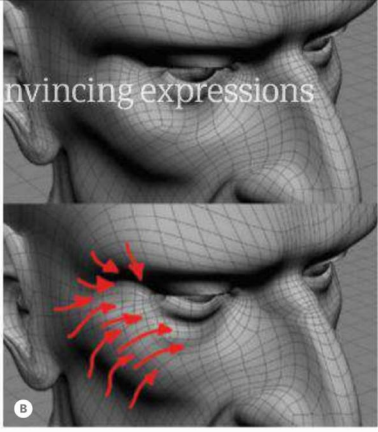
Particularly with realistic facial work, you need to be aware of where muscles interact with bone, where skin slides, where it bunches in different ways and where the soft and hard areas are located – even if you can't see them. It's this attention to detail that will make the difference between something looking realistic and fleshy, as opposed to stiff and fake.

Particularly with modelling facial muscle blend shapes, you should be as aware of the way they move as of how the final shape will look. There are many diverse methods of approaching facial rigging, animating and modelling – far too many to cover in depth here. So let's focus on a few key methods that I've found particularly useful time and again when bringing faces to life.

TOPOLOGY AND MODELLING

A few modelling approaches useful for realistic facial rigging





01 Good facial topology

If your facial polygon topology is sound, it should contain an animation-ready flow of polygon loops, built along the most significant underlying muscle lines. This greatly improves the transition between shapes, and helps create consistency when sculpting between muscle movements. This is especially important for sculpting facial shapes, as they are the sculpted end points of a movement, rather than just static poses. A slight corner lip creasing into a smile or a subtle frown can be easily registered by the observer. So, the better the sculpts take into account the consistent flow of the muscle topology, the more realistic and convincing the resulting transitions will be A.

02 Be aware of skin sliding

As a final pass on a facial shape, it can be good to sculpt in some skin sliding to simulate skin and muscle moving over bone. Select an area of points and move them in a way that is constrained to the underlying topology. This can either be achieved by using a Skin Wrap node, or by using a Mesh Snapping option in your Translating Vertices tool. The most useful thing you can have here is a mirror. Remember, the movement is as important as the final sculpt, so ensure you set key frames to test how your sculpts move as you're tweaking them B.

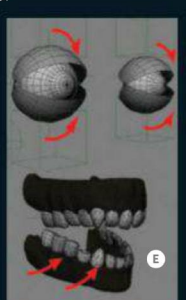
03 Use Vertex maps

The use of facial sculpts for making individual muscle expressions is excellent, as it gives you sculptural control over the look of all the muscles. However, when you combine shapes, you may encounter unrealistic results. An effective solution to this is to paint Vertex maps on problem areas that you can use to apply specific effects to. An example would be smoothing the shape of a mouth when a jaw opens, to simulate the stretching of the skin. For this I would simply plug a Vertex map into a Smooth or Relax node and have its strength driven by the rotation of the jaw C.

04 Sculpt some muscle

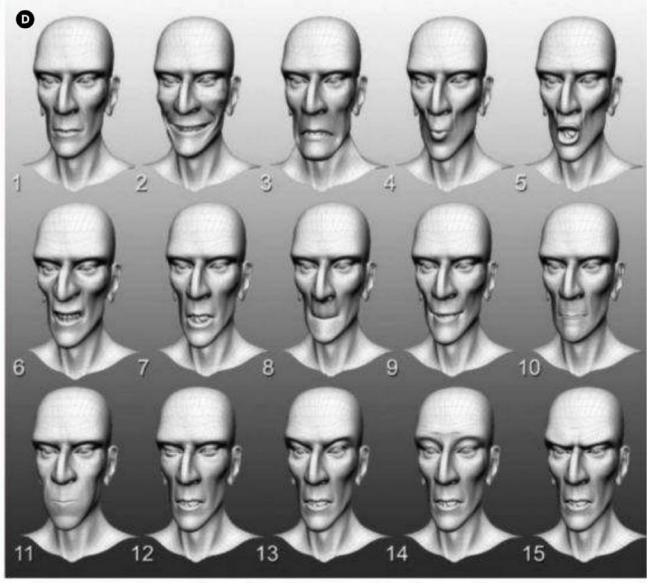
To create realistic facial animation, the best way is still to sculpt the individual muscles and combine them in animation to create various emotions. I've based a lot of my work on the system I used for Gollum, which was based on the work of Dr Paul Ekman, who divided up facial muscles into observable units. These form the basis of the minimum base shapes needed to animate a face (for asymmetry you will need both left and right versions of these) D:

1_Base shape
2_Lip stretch
3_Lip corner depressor
4_Pout
5_Funnel
6_Upper lip raise
7_Lower lip down/ raise (two shapes)
8_Lip suck
9_Dimple
10_Lip press
11_Puff cheeks
12_Squint
13_Outer brow raise
14_Inner brow raise
15_Inner brow lower



05 Why using bones for rotation is important

A morph is the translation of one point through space to another point. This movement, generally speaking, is done in a linear fashion. This approach is great if you want to describe a linear movement – and you can really get away with a lot for simple muscle movements. However, if you need to describe a rotation, such as the action of a jaw, an eyeball, or an eyelid that's following the surface of an eyeball, then you need to find an alternative. I personally find that enveloped bones are the simplest method for this E.



06 Control your shapes

The reason these shapes are necessary is that the natural additive result of two shapes is not always desirable. A lot of the time the additive result works fine, but as more shapes are added, the more the final result is in danger of losing sculptural control and collapsing. Ideally a network would be built up that has the sculpted results of all the shape combinations that ensure the system is always under sculptural control. This does, however, require a very large number of sculpts and some scripting. I find testing all the shapes to find the combinations that really need it is the best approach F.

A Polygon topology for a facial rig base shape with key lines painted on

B Animate shapes on the Timeline, so you can scrub to see how well they move

C Using Vertex maps to drive procedural effects such as smoothing can be very powerful

D More can be used, but this is the bare minimum number of shapes needed for facial animation

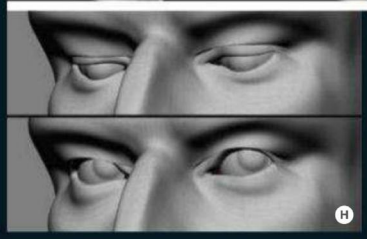
E Bones can be useful for rotating the jaw and eyelid

F Combination shapes enable you to sculpt the result of two separate blend-shape combinations

Facial motion-capture benefits

One effective method is to use the 3D recording of positional markers stuck onto an actor's face, the data then driving corresponding points on a CG model. The advantages of this are speed, as there is minimal animation time needed for keyframing and also a high level of realism in the timings. The disadvantages are first sculptural expressiveness: marker motion capture cannot gather the more detailed movements such as lips sucking in. Second is controlling the performance's fidelity when it's transferred to a differently proportioned puppet. Recent advances in 2D animation tracking tools, such as Faceware, are providing a good solution between accurate capture and artistic interpretation – although the artist does require a degree of observational skill.

G



H

07 Fine-tune using some corrective shapes

As well as combination shapes, corrective shapes can serve a similar function, but are more task-specific. These are the last options, usually used to fine-tune an effect built up by other systems. An example would be an addition to the smoothing necessary to simulate the stretching soft skin around the mouth when the jaw opens. The combination of an enveloped bone for the jaw and a Vertex map for smoothing might still leave the need for more sculptural control. Here you would sculpt the final look on the model, then add it again as a blend shape to dial in as needed G.

08 Know when to use automated eyelids

Eyelids tend to follow the up and down movements of the eyes fairly precisely. This is another reason why it can be useful to control the basic eyelid movement with bones, so you can drive the eyelid bones with eyeball rotations (you won't want the left/right rotations, only the up/down). It's advisable to put another null on top of the bone for extra animator control, as you will occasionally want to add to the automated movement. It can also be good to link the rotations with an expression that eases off the movement at the natural limits, to simulate the soft resistance of skin and muscle. This system is particularly useful if you are using tracked eye data, as it saves on a massive amount of hand keying H.

Bulging eyeballs

Use a lattice to simulate the effect of an eyeball bulging through the skin of the eyelid. Eyeballs aren't round; the best equivalent is a small sphere (the lens) intersecting with a much larger sphere. If you try to simulate this shape deformation with a pre-sculpted lattice, linking it to the eye joint to deform the eyelid flesh on your base mesh, you can get a pretty decent effect. There are more complex and accurate ways of doing this with volume and cloth deformation, but a simple lattice with a bit of tweaking should work. A few blend shapes showing the effects of left and right eyeball movement on the surrounding flesh, driven by the eye rotation, works well.

ANIMATING FACES

A few tips on how to approach this tricky subject...

09 How to start animating a characters' face

If you plan to key-frame animate a face, good reference is essential. Using a high-res clip from a film can be a good place to start, particularly if it has speech, as you can test your lip-sync abilities. It's also fun to film yourself and be the actor (animators are basically all frustrated actors anyway). I'd recommend always using QuickTime format for reference, as it enables you to advance frame by frame, which is essential for all animation reference (check what the frame rate is also) and it's easy to switch it between frame and time code display I.

10 The importance of blocking

Blocking out key frames of the most significant extremes is important to facial animation, as it is to all animation. This enables you to build up the detail slowly. It's useful to block and key all the channels of the face, even if you don't need to move them, as it effectively locks the expression in time and means if you change it somewhere else, it won't affect the current key frame. Remember that a face is never perfectly symmetrical when it moves, so add in one or two frame overlaps between left and right for more realism. Try to observe all the little asymmetries in your reference, because they're what will bring your animation to life J.

L

K

11 The internal monologue

Hand-animating realistic facial performances is hard. As well as reference, it requires an acknowledgment of the layered effect of facial communication. Part of what can create this complex state is what we call the internal monologue. This is internalised speech, often acted out subconsciously in the face through twitches, half-hidden expressions and eye movement. Often the result is hard to read clearly, but can be perceived as agitation that interferes or contradicts the more explicit contrived expressions. It is this level of detail that will give a performance a reality, even in copying. If the artist is not aware of the complexities of a performance, they can easily get lost in translation K.

12 References, references, references!

This final tip can't be emphasised enough. Whether you're animating expressions, rigging movement systems, making SSS shaders or modelling, the better your reference, the better the final product will be. I can't count the number of times I've had to go back to fix mistakes or fine-tune work because I've left my mirror at home, or only had a low-res YouTube clip (or was just plain lazy). Use your own head. It's with you all the time and all you need is a mirror to get you started L.

I

J

G The vertex smoothing and corrective blend shapes affecting the mouth area

H Automated eyelid movement that follows the eyeball rotation can save you a lot of time

I I find sliders are the best for animating faces, as they are very easy to edit

J Try not to key on too many frames when blocking out, and remember to key all channels

K Always consider the 'internal monologue'

L You have an amazing face, so be sure to use it!

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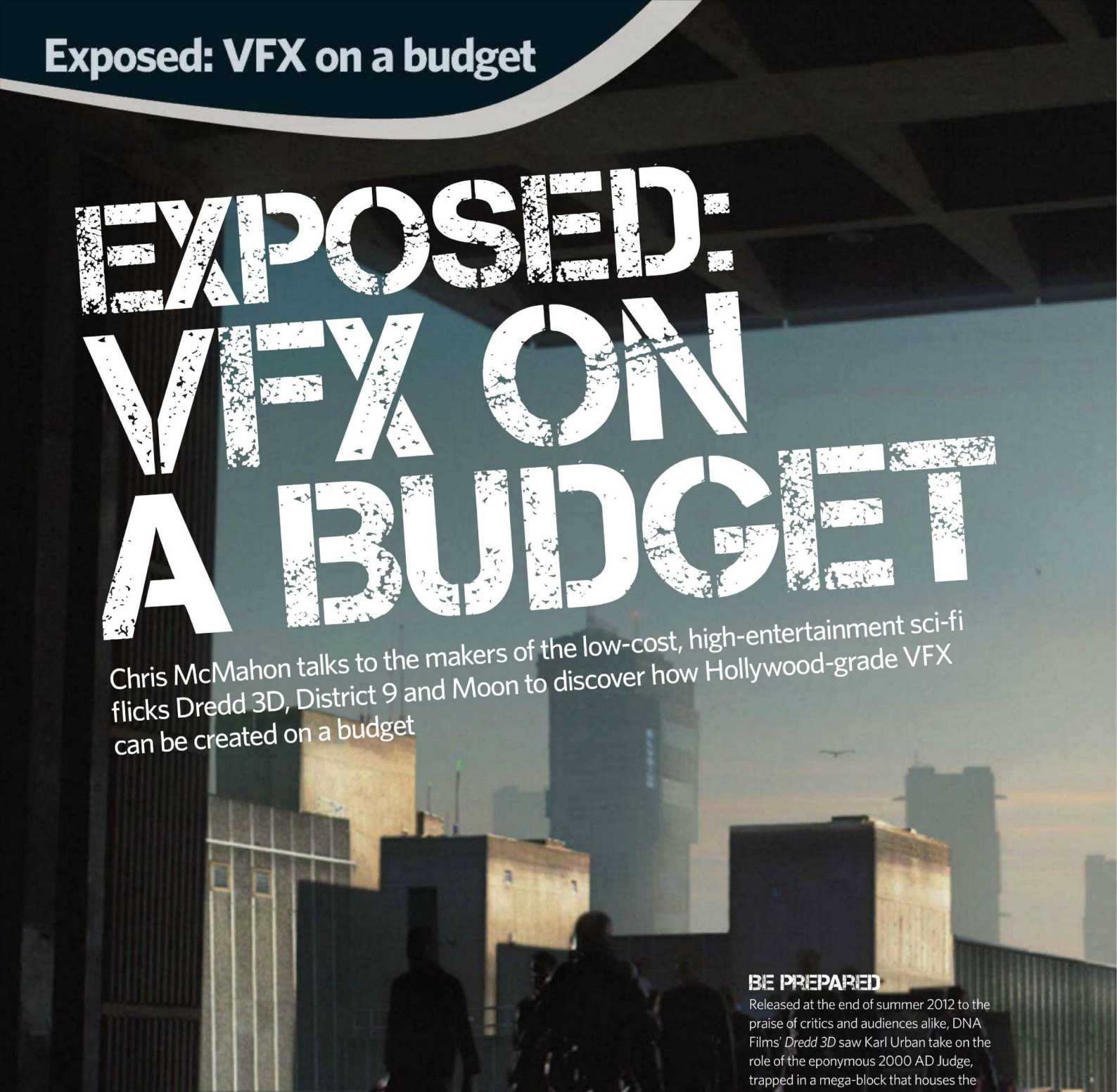
EXPOSED: VFX ON A BUDGET

Chris McMahon talks to the makers of the low-cost, high-entertainment sci-fi flicks Dredd 3D, District 9 and Moon to discover how Hollywood-grade VFX can be created on a budget



Dredd 3D images © Copyright 2012 - Lions Gate Entertainment

Made for the very modest sum of around $500,000, Gareth Edwards' 2010 sci-fi film, *Monsters*, was something of a turning point. This was a film that flew in the face of everything Hollywood had considered the status quo up till that point. One man – not a team of hundreds – had created this intimate alien-invasion-meets-road-trip adventure, using nothing but off-the-shelf software and his own artistic nous. It went on to gross $4,188,738; a small number for Hollywood, certainly, but by no means an insignificant one. It was indicative of the fact that silver-screen-quality visuals could not only be made on a shoestring, but go on to rake in the dollars from a visual-effects-hungry audience.

In recent years movies following *Monsters*' example have proven that visual effects can be done cheaply, convincingly and – most importantly for Hollywood – profitably. We set out to talk to the makers of three films that have astounded audiences with their affordable but nonetheless astonishing sci-fi futurescapes – *Dredd 3D*, *District 9* and *Moon*. Here we explore what tips and tricks can be utilised to generate breathtaking effects without putting a huge dent in the budget.

BE PREPARED

Released at the end of summer 2012 to the praise of critics and audiences alike, DNA Films' *Dredd 3D* saw Karl Urban take on the role of the eponymous 2000 AD Judge, trapped in a mega-block that houses the vicious Ma-Ma and her bloodthirsty clan.

A bloody, brutal and hard-edged action film, the production required numerous visual effects, including the creation of a vast, violent metropolis as the backdrop for the Judge's battle for justice. It was Prime Focus World's job to complete the demanding 650 stereo VFX shots for *Dredd 3D* on a budget far less generous than that afforded to the likes of *Avatar*, which the studio also contributed effects work to.

For *Dredd 3D*, though, Prime Focus World was tasked with creating the sprawling cityscapes of Mega-City One: building set extensions for the expansive Peach Trees

Exposed: VFX on a budget

> To make the process work and to spend the money in the right places, it's much easier if everyone... is frank and realistic right from the start

Jon Thum, visual effects supervisor, Prime Focus World

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In *Dredd 3D*, much of Mega-City One is comprised of real-world Johannesburg, although Prime Focus World extended the urban sprawl into the distance, adding huge highways and integrating the mega-blocks

Contributors

Brandon Fayette

» CG supervisor , production lead at Bad Robot Productions

BIO Having worked in many roles, Fayette found himself at Bad Robot Productions in 2007. He has worked on *Cloverfield*, *Star Trek* and *Super 8*

Adam Gascoyne

» Visual effects supervisor at Union Visual Effects

BIO Gascoyne began his career in the VFX industry over 17 years ago. He worked for Cinesite, MPC, Rainmaker and Clear Films before establishing Union in 2008

Winston Helgason

» Co-founder and president of The Embassy Visual Effects

BIO Helgason's role as an animator and artist in TV changed when he founded The Embassy Visual Effects. His company has produced many commercials over the years

Simon Stanley-Clamp

» VFX supervisor at Cinesite

BIO Stanley-Clamp started at The Mill in 1998, where he worked on *Lost in Space* as a compositor. Since then he has worked on *Harry Potter*, *X-Men*, *John Carter* and more

Jon Thum

» VFX supervisor at Prime Focus World

BIO Thum has been working as a digital effects supervisor for 15 years. He won an Oscar for his work on *The Matrix* in 2000, and received an Academy nomination for *Superman Returns*

Shawn Walsh

» VFX executive producer and partner at Image Engine

BIO Walsh started out as a 3D character animator, and then honed his skills as a senior lighting technical director and compositor at Rhythm & Hues and MPC

mega-block atrium; working on numerous exterior establishing shots. It was also responsible for the gorgeous yet luridly violent slow-motion sequences, induced by the character's inhalation of the dangerous new narcotic, Slo-Mo. To get it right on the budget afforded, organisation during the pre-production phase was key. Thankfully for Prime Focus World, rather than being drafted in later on in the film's production, the team was involved in the concept and design stage from the very start.

"We were involved early on during pre-production, working on ideas and conceptuals before even a director was brought on board, and determining how they could make the movie for what – in visual effects terms – is a fairly low budget," says visual effects supervisor Jon Thum. "Working out how to bring the scale of the movie onto the screen with those limited resources was a positive process for us. It was extremely rewarding in terms of the amount of creative input we had [on] the film, but also in bringing an economy to it, because we were able to concentrate our energy on the areas that needed [the most careful attention].

"The initial stages were similar in many ways to any VFX-heavy film – break down the script, get an estimate of the shot costs as a ballpark figure, see if you can juggle the shot counts to get close to the right figure and work out what's important and what isn't," Thum continues. "For example, the script for *Dredd 3D* allowed us to concentrate on VFX that contained mostly environment work, FX and digital double work. [At an early stage in the process we ruled out] the possibility of doing CG robots, which may have added something to the ambience, but actually weren't really necessary for the story.

> **"Finding ways to repeat, duplicate or share assets across a CG build is vital when keeping productions within a budget"**

"The look of the CG was therefore never in doubt – our focus could then be how to achieve it on a technical level. We knew the shots would throw up some extra problems to solve, but we knew we were on solid ground with our core assets and pipeline strategy. To make the process work and to spend the money in the right places, it's much easier if everyone is on board and that discussion is frank and realistic right from the start."

Money-saving techniques such as re-projection and re-using assets were also utilised in order to expedite the production pipeline. "As an example, for the buildings in Mega-City One we would develop a certain amount of these to a level of finish that works for most shots – let's say four hero close-up buildings and eight mid-ground buildings," says Thum. "In any given shot we would assess the render and then paint extra detail into any of those buildings, if necessary. [This] could be graffiti, texture variation or even adding vents and lights. In any shot without a big camera move this could be re-projected back onto the geometry and re-rendered. This made for a very quick turnaround and a much shorter pipeline than if we had to re-model and re-texture every original CG asset."

RECYCLE MATERIAL

2009's *District 9* similarly benefited from a well-organised and properly conducted pre-production process; one that ensured the finished product would remain within the stipulated budget.

"Multiple factors contributed to making every dollar stretch farther," says Shawn Walsh, visual effects executive producer at Image Engine, the vendor responsible for the impressive implementation of the movie's Prawn aliens. "Behind the work was a very strong strategy that took into account the creative direction and the design; the actual pipeline and execution theory; and a good relationship with the filmmaker that allowed for a rapid production environment.

"For example, we had a schedule that enabled us to begin work very early," continues Walsh. "We started fleshing out and completing the aliens from a design and modelling perspective in advance of shooting. [We had] two or three months during which we could do some pretty serious development of the creatures and determine what was going to be possible prosthetically and what wasn't. Neill (Blomkamp, director) was able to change direction and go with a 100 per cent CG approach to the aliens at a time that was crucial in terms of the on-set spend."

This all-CG approach obviously meant more work for the team at Image Engine, but they were able to increase pipeline efficiency while decreasing spend by introducing new technology. "You look for areas where you can get blood from a stone from a creative perspective," says Walsh. "For instance, we built a system for managing variation, both in terms [of the] base model of each alien [and] also their surface qualities – the texture mapping and additional trinkets and things that they

> **"It's about being efficient. Visual effects can take a really long time and not move forward that fast, but if you're forced to move quickly it can often be the better way to work"**
>
> **Winston Helgason,** president, The Embassy Visual Effects

Usually, a director or producer will hire their own concept and design team and pass the work onto a VFX vendor later on. In *Dredd 3D*, the Prime Focus World team was involved with the film's creation from the very start

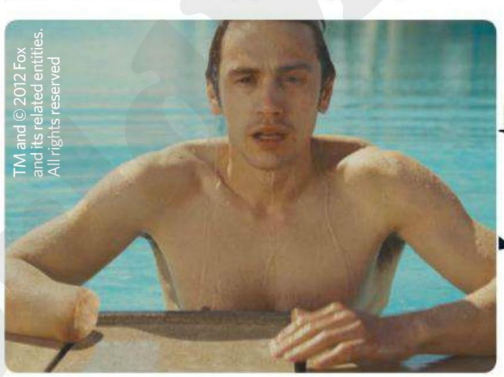
Exposed: VFX on a budget

"The streamlined process of developing and creating assets that feel physically real has come a long way, and is really contributing to a lot of increased economy," says Walsh

"The role of Neill [Blomkamp] on *District 9* can't be understated," says Walsh. "His knowledge of VFX meant he understood the challenges, and was able to navigate potential issues better than a filmmaker without that experience"

DRAMATICALLY DECREASE COSTS

It's not just sci-fi films that need cost-effective VFX, as demonstrated by 127 Hours, the Danny Boyle-directed one-man survival drama. The London-based Union Visual Effects was drafted in to work on a multitude of shots, including digitally-created terrain and the removal of James Franco's arm. "Working with smaller productions doesn't have to mean cutting down on the quality or quantity of visual effects in a show – there are many ways to increase efficiencies if all departments are able to collaborate productively," says visual effects supervisor and Union co-founder Adam Gascoyne. "*127 Hours* is a good example, which had a lot of constraints during filming, from environmental challenges, short timeframes and limited crews. With a film like that, the key was to find solutions that didn't involve huge crews – to the point where I would end up filming sequences alone in the desert, while the crews were battling time constraints in other locations. This kind of approach not only pushes production costs down, it also keeps you thinking creatively."



"Our close relationships with directors, editors and producers help guide productions through the visual-effects process without the potential wastage you might associate with larger tentpole movies," says Gascoyne

Quick turnaround on ideas, rather than constant reiteration, is key to saving money. On District 9, an issue with the aliens' facial animation went from a problem to a solution in just one weekend!

District 9 images © 2009 TriStar Pictures Inc. All Rights Reserved

Exposed: VFX on a budget

would wear. This technology enabled us to create more visual variation on [the] screen than the budget would normally account for. It seemed like a massive jump in visual sophistication, but was actually quite economical in terms of managing the CGI."

Much like with the mega-blocks in *Dredd 3D*, finding ways to repeat, duplicate or share assets across a CG build is vital when keeping productions within a budget. Leveraging work from a past project and recycling it for a new agenda can completely avoid the expense of modelling entirely new assets for every shot.

Case in point: Cinesite's work on the super-low-budget tale of paranoia in space, *Moon*. The studio's work was competitively priced, with the vendor delivering the film for under a million dollars. "For us, internally, going back over the history of things we've already built and reusing them is extremely helpful," says Cinesite VFX supervisor Simon Stanley-Clamp. Although the rover vehicles in the film were miniatures created by another company, Cinesite could theoretically have made them quickly and easily if the production had required it. "We've got a whole garage of assets, and we can take that stuff and apply it to new shows. In something like *Moon* you could take a tank, rip off the caterpillar tracks and with minimum modification you've got your rover vehicle. These days you don't have to start empty-handed," Stanley-Clamp adds.

THE COST OF COMPLEXITY

But what is it that truly causes costs to skyrocket? What are the factors that send the VFX budgets of the John Carters, Harry Potters and Titanics into the stratosphere? For Winston Helgason, president of The Embassy Visual Effects – the vendor responsible for the mech-suit sequence at the end of *District 9* – the complex simulations created by tools such as Houdini are to blame.

"We did *Battleship* this year and in that we worked on shots with these crumbling bridges with cars on them and things like that," he says. "Whenever you do a shot like that, with all the debris passes and such – that high-end work is the stuff that's really, really expensive."

Walsh, who worked on the high-budget *Battleship* with Image Engine, also believes that a rise in budget is directly related to how complicated the VFX has become. "Complexity always creates cost, regardless of who is executing it," he says. "If you look at something like *Battleship*, we worked on a very economical portion of the film – a single, contained sequence of around 80 shots where we created a creature and embedded it into an action sequence.

KICKSTARTING VFX

Brandon Fayette, lead artist at Bad Robot Productions, recently funded his own project, DOME, through Kickstarter. It promises to be the world's first feature-length animation to equal the visual quality and scope of a major studio animation at less than one per cent of the cost.

"One of the things I've done for years now is work on projects with skeleton budgets," says Fayette. "By embracing the limitations and knowing that we have a ceiling in regards to resources and power, we can build the world with those limitations and turn them into strengths."

Fayette, who is using open-source tools such as Valve's Source Filmmaker to create the work, utilises a variety of tricks to keep things looking good. "For example, not being able to have a tree that is two-million faces in the scene due to memory limitations is difficult," he says. "Since we cannot do displacement mapping we instead use normal maps and a thoughtful structuring of our silhouette in the lower-resolution model in order to achieve a look that works. Further camera settings like depth of field and motion blur allow the tree to integrate into the shot and sell the idea.

"That, I believe, is the give and take that allows us to create a look that is unique and interesting with *DOME* and lets the viewer sit back and enjoy the story as it unfolds." You can learn more at **www.tinyurl.com/domekickstarter**.

For Fayette, staying on budget is easy: "Be very structured and streamlined in your pipeline," he says. "Weather the hiccups that happen in an intelligent way [to] keep the project moving and not waste time or money"

Although simulations created in Houdini can dramatically increase the spend on a film, the software was used in *Dredd 3D* when the character fires white phosphorous rounds at enemies

Moon images © Copyright Liberty Films/Sony Pictures Classics

Exposed: VFX on a budget

> "Look for areas where you can get blood from a stone from a creative perspective"
>
> **Shawn Walsh,** visual effects producer, Image Engine

Industrial Light & Magic, however, completely rewrote all of its water tools in order to execute the work. When you're delving into that level of complexity that requires a research and development phase beyond standard tools, I think that's a very legitimate reason for costs to increase."

There's something else that can cause budgets to skyrocket, however, which can be more expensive than simulations of software packages: indecision.

"The screw-around factor, for lack of a better term, really is the difference between a big-budget production and a smaller one," says Helgason. "In those bigger productions you spend more time experimenting with different things. For example, we were doing *Cowboys & Aliens* and they wanted to add an extra element to the explosions of the alien ships, so we ended up doing numerous versions of the same shots, just redoing [them] over and over, which [then had to be] process[ed] through the pipeline. You can just keep going back and forth forever and it really swells the budget.

"If you know what you want to achieve... you've got a target in mind and you're getting it done as best as you can really quickly, in some ways that's the best way to work. It's about being efficient. Visual effects can take a really long time and not move forward that fast, but if you're forced to move quickly it can often be the better way to work."

Walsh has experienced many similar situations while at Image Engine. "With smaller budgets where there isn't the same sense of flexibility it causes people to not only think more creatively, but also get to a decision more quickly. Things get approved in a much more fluid manner simply because everyone knows that they need to be. On a lot of bigger-budget projects they'll explore, take more avenues, play around more and [experiment with] a lot of things simply because they can, and that can cause a huge amount of cost. When you're on a more meagre budget you have to be focused on solutions."

THE KEY TO SUCCESS

Being prepared, carefully managing assets and being consistently focused in your execution can all keep a budget down. But there's one remaining factor that's more important than the software, the tools or the size of the vendor.

"I think it's important to remember that VFX is not just a technology, but also a craft," ruminates Thum. "There can be an overemphasis on technology sometimes, which is not to say that it's unimportant, but on a large project like *Dredd 3D* a lot of technology goes into helping the artist work efficiently, making sure he spends his time doing his craft and not fighting the system. In terms of matching the fidelity of the Hollywood blockbusters, if you've got a good artist, off-the-shelf software and of course, enough time, he or she could produce something good enough at home."

It's *the people* who are most integral to creating Hollywood-grade visuals. Their craft and ability are the key to achieving beautiful and believable VFX, without bankrupting the producers. That was the secret of Gareth Edwards' one-man-army success on *Monsters*.

For Stanley-Clamp, getting the right team on *Moon* was a must. "When I geared up for it I looked for more commercially-minded operators, people I'd worked with in the past at The Mill and other experienced Flame operators who I knew could work quicker and think a little bit more on their feet. We also learned to use generalists – perhaps one person who was multi-skilled and could both [create] and texture their own model, or perhaps even rig and light it. That was extremely helpful."

Walsh also believes that putting together the right team is pivotal when keeping a budget within acceptable parameters. "Finding the right combination of VFX artists, supervisors, producers and so on, who have a particular experience that they can bring to bear on any work is a key factor in finding economy," he asserts. "Certainly with *District 9* we had a group of people who had – in one shape or form – all done high-end creature work in their past, so we had an idea of the steps we had to take and the team we had to build. From a filmmaker's perspective, finding those key collaborators that understand the challenges of your film and can diagnose not only those design aspects but also the pipeline aspects, is absolutely key to analysing the project and how you deploy the resources."

Helgason succinctly concludes: "We've got guys who have been at The Embassy for ten years... I know when I hand them a shot they know exactly what they're doing and they're going to get it done faster than a team of three or four other guys.

"It's really all about the people. It's all about the artists and it always has been about the artists. That's the only way you're going to remain profitable while achieving great work."

Cinesite didn't create the miniature vehicles that were used in *Moon*, but did work on many shots that comprised green-screen comps, matte paintings and particle work to make the scenes feel larger and more physical

I made this...

Incredible 3D artists take us behind their artwork

Artist info

Victor Maiorino Fernandes

Website
www.victormf3d.blogspot.com.br

Country Brazil

Software used 3ds Max, ZBrush, V-Ray, After Effects, Photoshop

Bio Victor was a 2D/3D generalist but now focuses on lighting, shading and renders.

"I started by doing some ZBrush studies and 2D sketches until I got something I liked. After that I did some tests with player positions and action displays. Each skin tone was varied a lot in the shader settings"

"In the future I plan on experimenting more with character and anatomy stylisation in my scenes. This is something I really liked in my image"

Let's Play 2012

When I first started making this piece I was thinking of [creating] just a turntable model, but after I finished the characters I really liked the result and was encouraged by some friends from my last studio to do a complete scene. I like basketball very much, so it wasn't a big effort to go through loads of references of players, logos, basketball courts and movement scenes. That made me feel really inspired!

Software used in this piece

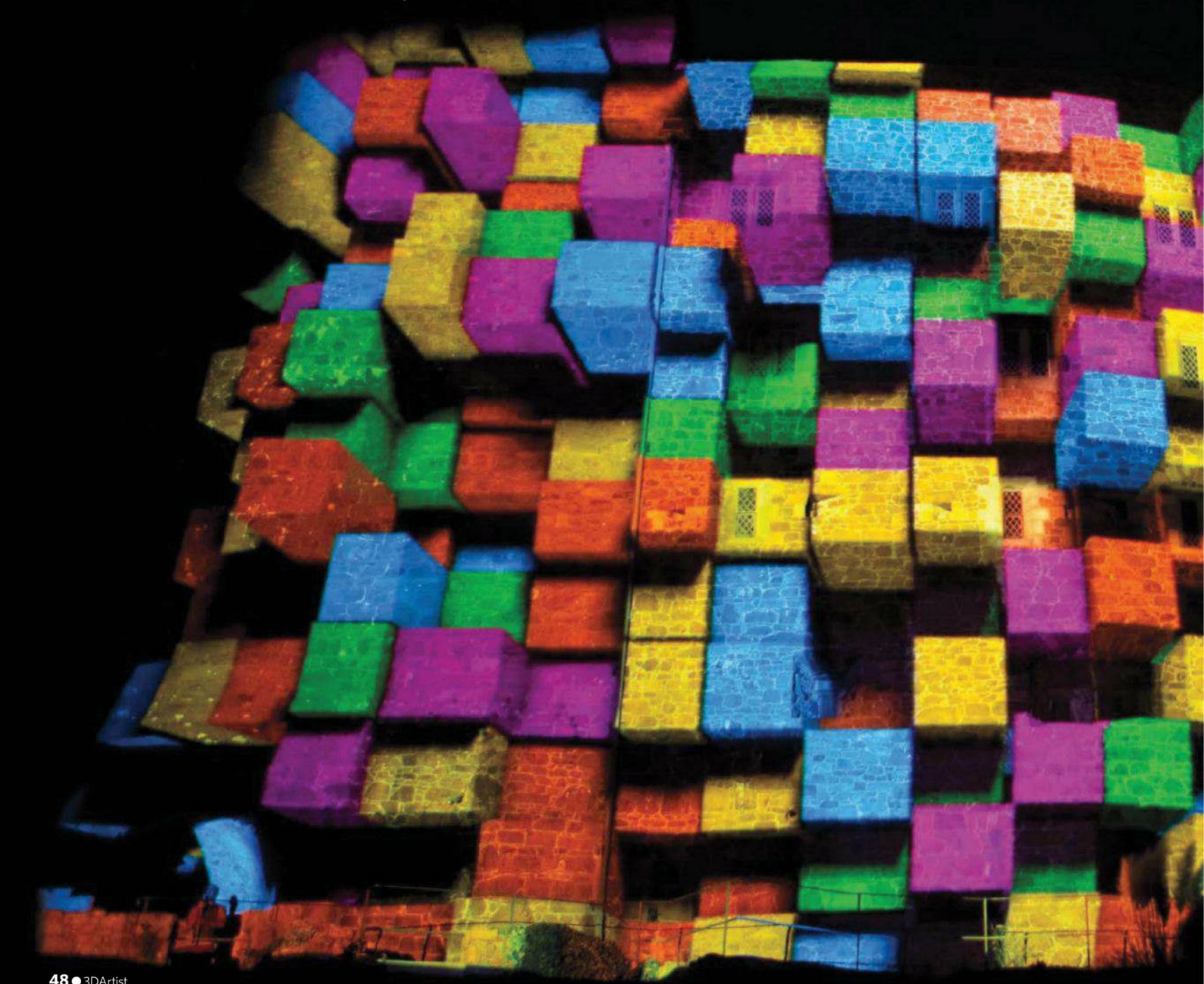
3ds Max | ZBrush | V-Ray | After Effects | Photoshop

"Composition was the hardest part. Finding something I liked wasn't easy, and even though I went through a lot of iterations and polishing I wasn't really satisfied. I had to make lots of adjustments to get where I wanted"

"I've learned a lot with this image – especially the need to have good planning for a scene, an extensive pre-production phase and maintaining organisation. This is a great way to help finish a scene with a large number of elements"

THE ART OF PROJECTION MAPPING

Projection mapping is now a popular and powerful art form, captivating audiences and inspiring artists. Chris Bradley, production assistant at the **seeper** collective, reveals the secrets of the specialists...



The art of projection mapping

> The magic of projection mapping is the suspension of disbelief, transforming the physical by morphing it with the virtual
>
> **Evan Grant,** founder, seeper

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Studio seeper
Personal website www.seeper.com
Location Shoreditch, London
Expertise Multi-sensory experiences
Tools CINEMA 4D, After Effects, C++, seeserver media mainframe
Clients Vimeo, Google, Volkswagen, Xbox, V&A, TED.com
About An interactive arts and technology collective founded in 1998, seeper explores user interaction and ubiquitous computing to create multi-sensory experiences

Emerging from the intersection between technology and the arts, projection mapping – showing animation, video footage or interactive content on the side of a building – is becoming more and more popular. It's a talking point, an event and an experience. It's an art form that's more than the sum of its parts, using advanced projection techniques to re-create and distort a building's architectural features. Projection mapping challenges the way the spectator experiences the space around them and can transform the physical reality of the building in front of you to staggering effect.

At East London-based arts and technology collective seeper, we strive to create immersive real-world experiences, using that mix of animated 3D, generative real-time and interactive content. All of these have to be in harmony with the façade of the building being worked with, because projection mapping is all about taking advantage of a building's surface, texture and detail.

"The magic of projection mapping is the suspension of disbelief, transforming the physical by morphing it with the virtual," explains seeper's founder Evan Grant. "[We respect] the form of the object or building and [treat] it with real-world principles, using light, shadow and physics to create the illusion of depth. Done correctly and seen with the naked eye, it can appear hyper-real, even surreal". But there's a lot of work before that stage is reached: planning for and creating the show takes time before we reach the final outcome.

The art of projection mapping

> Everyone has their smartphone or camera at the ready, waiting to capture that moment of illusion

Alignment issues

Aligning the projectors perfectly can take a while, but the results are worth it

Alex Tennyson, seeper producer, explains they used "an alignment image for 'Titanic 100' to help us see if we were mapping accurately to every tile. It looked insane. There were over 2,000 unique tiles that made the alignment extremely complex. It's important to get this as accurate as possible. It took us three days to perfectly align the projectors on three sides of the building". Edge blending is also a key part of the process. There were 24 projectors on the 'Titanic 100' project. We needed our content to seamlessly move between the projectors, so we blended the edges of each projector to do this. In the non-digital world a good comparison would be wallpapering a patterned paper: everything needs to line up perfectly, or it looks stupid!

Fireworks accompanied the motion graphics to make sure seeper's 'Titanic 100' project went with a bang

PLANNING AND PLOTTING

When a project comes into the studio, our first reaction is to get excited and start talking about it, coming up with ideas and the various directions we can take it. The range of projects that come to us is staggering, from the sublime to the ridiculous, we've had it all.

We don't like doing the same thing twice, so the first challenge is working out how we can approach the new project in a fresh way. A successful mapping project involves a significant development process, which considers and complements the architecture of the building and surrounding environment. It is vital that content is created to suit the character and limitations of the building in question, or that a building is chosen that is suitable to the desired content. Buildings with many intricate features may suit an abstract visual performance of colour, shape and movement. A pale, flat building with a few features could support a more representational or figurative visual style.

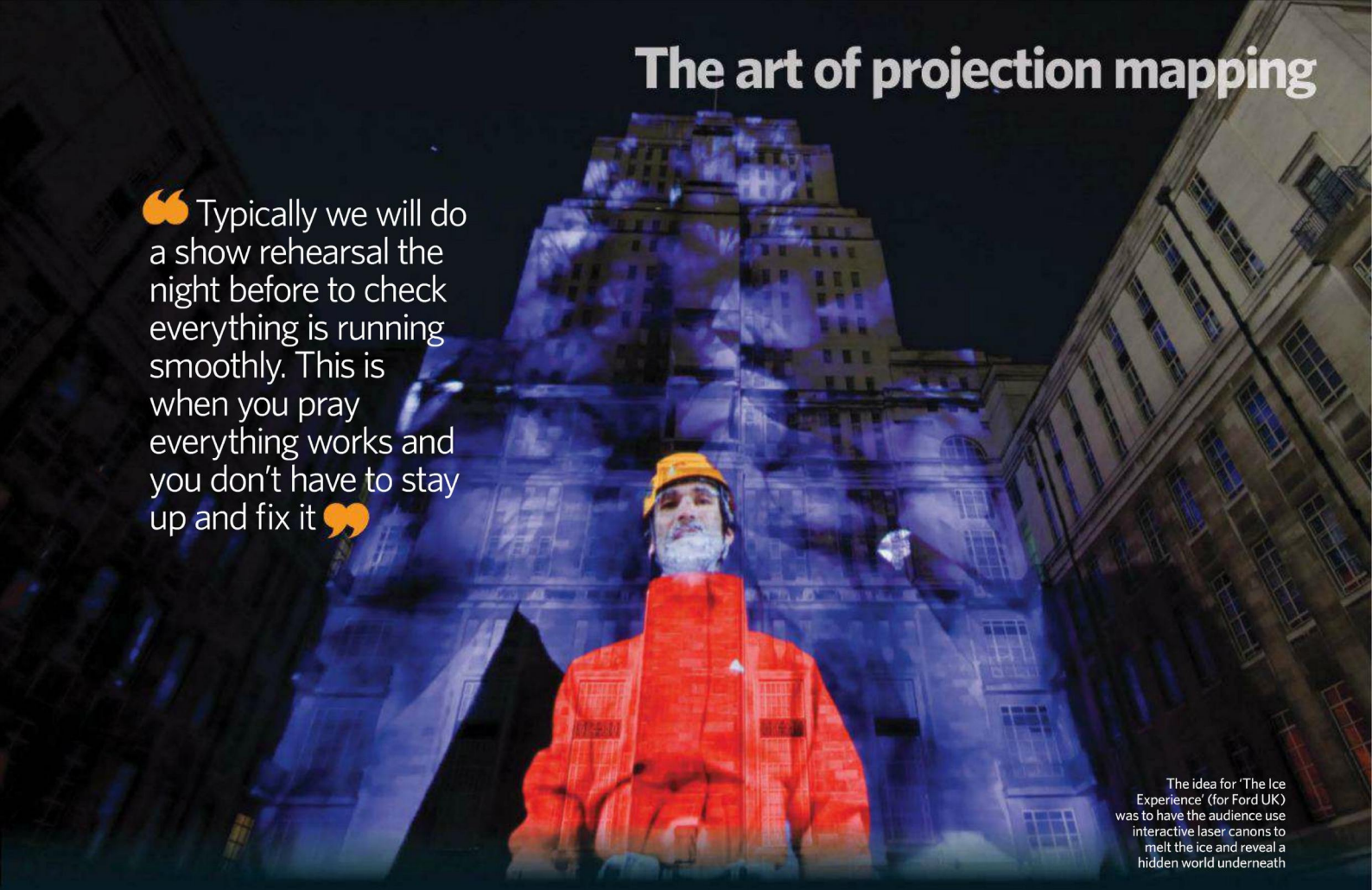
Once a building has been selected we need to make a 3D model of the structure. It's surprising how often architects do not have a record of the final structure they build, so often we have to commission a laser scan. Every facet can then be plotted and manipulated during the process.

Depending on the project, we will then design and produce animated 3D, generative real-time or interactive content, but many will require all three. A recent example would be the 'Nokia Ovi Maps' display we did in Covent Garden. We were tasked with designing our work to transition seamlessly between interactive content and a pre-rendered sting. Regardless of what type of project it is, though, our creative team will produce exhaustive storyboards and style frames to give the motion designers and creative coders a base to work from.

The time we spend on the brainstorming stage can vary enormously. When we were commissioned to put on a massive 40-minute show for the Titanic 100th Anniversary at the Titanic Belfast centre, we had to spend weeks and weeks working out what the show should be. In contrast, when we created an interactive show for Google Chrome at the Westfield Shopping Centre during Christmas 2010, the development process was much more organic.

However straightforward the project is to get started, it's once the creative direction, concept and storyboards are all established that the real work begins.

> Typically we will do a show rehearsal the night before to check everything is running smoothly. This is when you pray everything works and you don't have to stay up and fix it



The idea for 'The Ice Experience' (for Ford UK) was to have the audience use interactive laser canons to melt the ice and reveal a hidden world underneath

CREATING THE CONTENT

Actually making the content that we'll project is the most time-consuming aspect of producing a show. The size of the team varies with the complexity and scope of the project. Unbelievably one of our favourite projects, the 'Battle of Branchage' in Jersey, was produced in three weeks with a team of two, while the 'Titanic 100' show had a workforce of over 20 professionals working on the project over a period of months.

At this point we have to ask ourselves various questions. What is the best viewing position for the audience? Where are the projectors going to be placed? Once we have gathered all that information, we can open up CINEMA 4D and get started. Our artists have to set up the scenes and camera positions that replicate the physical viewing position of the audience on-site. This makes sure that the 3D perspective works for the people watching the show. Getting this right is extremely important. Motion designer at seeper, Jordi Pagès, explains further: "The first thing we create when we start to produce 3D graphics for the show is a master file with the model of the building and the camera positioned in the same angle as the spectators. Every designer has to start each scene from that file and the model and camera are untouchable; if they are moved the alignment would be impossible."

Pagès continues: "Creating motion graphics for projection mapping is like creating motion graphics for any other format, there are just a few extra rules. For instance, it is really important that all the content matches with the shapes of the structure. [One of the first things to remember is] the projection is never as bright as your computer screen, so you need a lot more contrast on your images."

Of course, the show doesn't have to exist purely on the walls of the building. We love integrating other mediums and motions into our displays, but every aspect of the show has to be factored in at this stage to produce a fluid projection. In May 2012, we produced part of 'Wings of Desire' for the International Dance Festival in Birmingham. The performance merged projection, dance and acrobatics. Angels gathered on the rooftops while we sent light bouncing around the town hall. In other instances we have integrated vast pyrotechnics into our show, in sync with the projection.

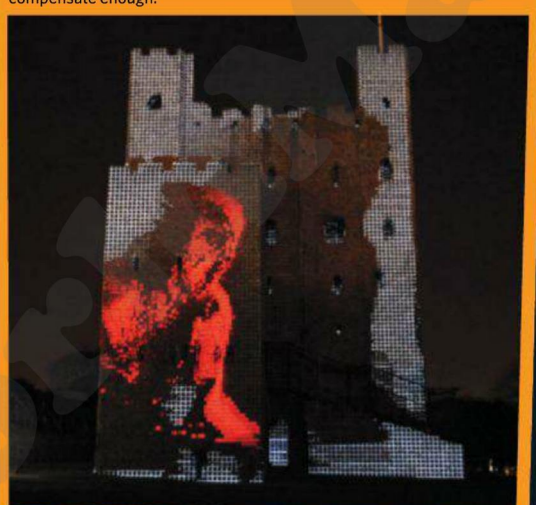
With the show planned to the last detail and the hours of hard graft in CINEMA 4D complete, the export process will begin. We will render out content in 4k resolution and our poor servers then have to pump these out day after day, turning the studio into a temporary sauna.

The light not-so-fantastic

Certain surfaces make things particularly hard, as does excessive light pollution

We don't normally have to put anything on the buildings we work with. That's the beauty of projection mapping; the building is our canvas. However, sometimes it's necessary to use extra materials. For example, we recently did a project on the IMAX building in Bournemouth and since that was completely clad in glass, we had all the glass panels covered in black vinyl. Glass doesn't hold projection very well.

As well as the surface being projected on, the building's position and surroundings have to be taken into account. Light pollution is a nightmare. The darker it is (like it was at Rochester Castle, pictured below), the more contrast there is between the projected and non-projected areas, so the illusion works much better. If there is loads of light pollution, then we will need to use much brighter projectors, but this still doesn't always compensate enough.



The art of projection mapping

In the run-up to Christmas 2010, seeper turned an exterior wall at Westfield shopping centre into a huge videogame display

LIGHTS. CAMERA. ACTION!

Once we get on site, there's an awful lot of work to be done setting up the projectors and aligning them correctly. On our 'Titanic 100' project there were 24 of them, all of which needed to be positioned correctly, tested, focused and edge-blended. Even for our founder Evan Grant and producer Alex Tennyson, who have done this time and time again, it can take all night to set up projectors. We also have to set up the seeserver media mainframe, which is our completely custom-built system for projection mapping, both for pre-rendered and more importantly real-time graphics playback. We got our own bespoke media server after we found that other platforms couldn't do both real-time graphics rendering and projection mapping simultaneously. We worked with the guys over at AMD and added a whole bunch of other custom-built software. We're thinking of releasing it very soon for other budding creatives to play with.

With everything in place, typically we will do a show rehearsal the night before to check everything is running smoothly. This is when you pray everything works and you don't have to stay up and fix it. The night of the show is always fantastic. There's a buzz in the atmosphere as people walk past the building and become intrigued when they see huge projectors, not sure what they are about to see, but knowing that a spectacle is about to unfold. Everyone has a smartphone or camera at the ready, waiting to capture that moment of illusion. As the seconds tick down, the projectors are fired up and all that's left to do is hit Play on the seeserver media mainframe.

Our shows vary massively in style, content and length, but whatever we've created, it's over before we know it. What's great is you get home that evening to find masses of Tweets, video and pictures of your work already gracing the internet, spreading the projection to all corners of the globe. For some of our projects the online impact has been incredible. The Festival of Light we contributed to in Derby in November 2011 was seen by millions, courtesy of the BBC covering it.

It's not the scale of the audience that really matters to us, it's more about the essence of experience for each individual, making them question what they are seeing for a moment. If you walk away from the show with a bubble of excitement and fascination, then seeper has done its job.

> "If you walk away from the show with a bubble of excitement and fascination, then seeper has done its job"

Despite weather issues, being on site does have its advantages. While setting up for the Xbox Kinect project in Germany, for example, the seeper team bumped into celebrity, Sylvie Van Der Vaart!

Weather worries

You can control your camera angles and your content, but the weather can still throw a spanner in the works...

The weather can be a battle. Setting up in Belfast for the 'Titanic 100' project was particularly tough. We spent three days getting ready with the heavens open and gale-force winds howling. In these scenarios, there's not a lot we can do except solider on, though, and we've only had to cancel one show because of bad weather. It just makes everything more difficult and it's a bit worrying when it's tipping it down and we have projectors worth £100k each outside. It's not just rain that can conspire against us, there are so many things that can jeopardise the show. There's losing power, lighting, cabling, security, laser pens, bulbs on projectors blowing, computers crashing and so on. When there is so much tech involved, unfortunately so much can go wrong!

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www.SpeedUpMyRenders.co.uk

behind the scenes

3D artists explain the techniques behind their amazing artwork

Artist info

Dmitry Denisov

Personal portfolio site
www.dmi3ryd.com

Country Moscow, Russia

Software used
ZBrush, Photoshop, modo

Expertise Character modelling, texturing and technical visualisations

With the Disc

- OBJ files, textures, presets for modo, a ladybird ZTL plus tutorial screenshots
- An exclusive UVLayout Hobbyist software trial

Concept

I've always liked pictures of the macro world; I love the sense scale and incredible levels of detail. I also particularly enjoy using bokeh effects with a large depth of field.

Software used in this piece

modo · ZBrush · Photoshop

Learn how to

- ☑ Work with references to create a basic form
- ☑ Create simple topology using ZBrush DynaMesh
- ☑ UV map a model
- ☑ Master the Unfold tool and adaptive packing UV
- ☑ Paint textures and use alphas for texturing
- ☑ Sculpt models in ZBrush
- ☑ Create normal and cavity maps for your projects
- ☑ Work with materials and create fur
- ☑ Add particles to a scene
- ☑ Tackle an advanced lighting and rendering setup
- ☑ Composite your image for photorealistic results

Simplicity is the key!

From experience, I understand that in the modelling and retopology stages it is very important to understand what direction and flow polygons are. To better understand polygon flow I recommend you draw topology onto your model. Try to make the most of polygons with the same size and equal to the square. If you want to know how perfect your model is, look at the Density Grid and compare all its different parts.

LEARN TO CREATE Photoreal 3D

Macro ladybird shot 2012

"Learn how to re-create a photorealistic model of a ladybird"

Dmitry Denisov is a 3D modeller working on game-dev and character projects

In this tutorial I will show you how to create a photorealistic image of a ladybird using modo, ZBrush and Photoshop. We will discuss modelling techniques, topology, UV mapping, sculpting, texturing, applying diffuse and normal maps, lighting settings and the final post-processing of the image.

I'll begin by showing you how to create a simple model using DynaMesh in ZBrush and then retopologise in modo. You'll learn how to use Replicators to create convincing water drops and air particles. We'll also cover how to build a real-world camera, setting up the focal length, aperture and bokeh effects.

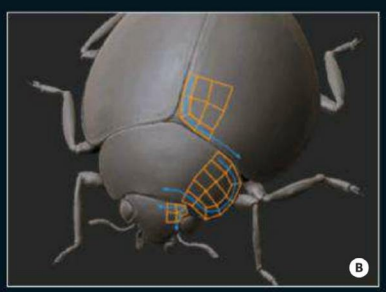
Finally, you'll learn the basic aspects of composition, photorealism and other details that can make a final image far more expressive. This tutorial assumes that you are familiar with basic skills in modo and ZBrush, because we will talk only briefly about the functions of these programs.

Finally you will learn how to work with the components of the image and fully utilise render passes. Colour correction will be reviewed in detail and we will also look at how noise can improve images.

Model the ladybird

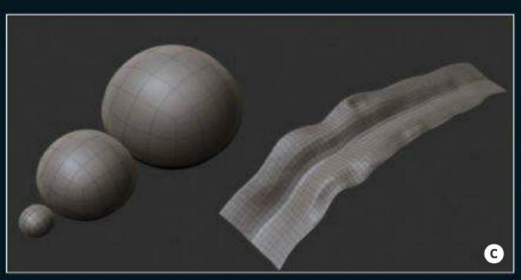
Begin with ZBrush DynaMesh in ZBrush

A



B

01 Create a simple sphere After using Convert to DynaMesh, with a medium resolution from 64-80, you can very quickly sculpt the basic form of the body and other parts of the ladybird. If you have references (front and side views) you can import these into the Viewport for better modelling accuracy. Use the Move and Clay brushes to create the basic form of the body, head, eyes and legs. If your geometry is very stretched, hold Cmd/Ctrl+LMB on an empty area to refresh your geometry with DynaMesh. You can also use simple primitives to model the legs. The point is to create a basic form with a medium resolution and sculpting detail. Remember this is a sketch at this stage – we don't need a super-detailed image A.



C

A DynaMesh and the ready ladybird model with retopology

B Good retopology. Blue lines show a polygon flow

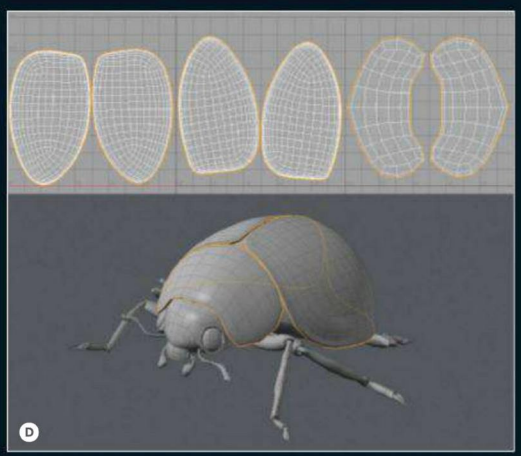
C Presets of the water drops and a very simple leaf mesh

02 Use GoZ to move the mesh to modo I recommend you first draw the topology on your model and then create the retopology. Add a new mesh and set focus on it. Go to the Topo tab, then go to Tools>Pen and create the first quad on your model. As we will very often use a Topology Pen, it's best to set up a hot key. Hold Shift and drag LMB to extrude the edge; you can also extrude vertexes. Please focus your mind on topology and try to feel the polygon flow. Always remember that it's better to have a polygon as a quad – do not stretch polygons and keep all quads the same size. Try to use this rule and the results will be very accurate and comfortable for sculpting. If you find topology terms difficult to understand, as well as retopologising in modo, please take a step back and draw on your topology using PolyPaint, and then apply Symmetry once more B.

03 Create the environment: leaves and water drops This is a very simple part of our scene. Add a plane, divide it as shown and use the Bend tool. Remember, you only need a part of the main leaf, so you don't need to create all of its parts – a simple form is the key. We'll also need leaves in the background to create an atmosphere and to show the scene with depth of field. Arrange the leaves in such a way that you achieve a small bush. Remember that all of your leaf planes must have a small amount of thickness C.

Create realistic textures and materials

Begin UV mapping the model using modo



D

05 Sculpt the ladybird detail

We'll use the Standard brush with Alpha 07 or 23 and Spray options to create surface noise. There's nothing special here; simply create a couple of subdivision levels and sculpt them. You can also apply surface noise to your model and relax it with the Morph brush. After that we need normal and cavity maps to adjust the realism of our model. In our case we will use Multi Map Exporter because our model has UV offset. Now we have both normal and cavity maps we can move to the next step: setting up the right scale for the model using the Absolute Scaling tool E.

E

D The Unfold tool with cutting edges and UV packing set to 0, 1, 2 values

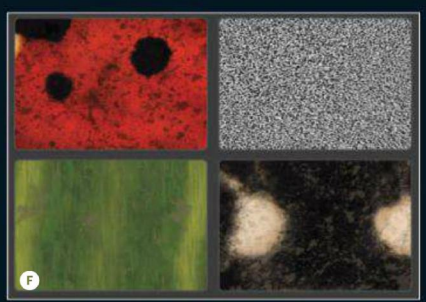
E ZBrush sculpting using brushes, alphas and normal baking

F Textures for the ladybird, diffuse and cavity maps

G The main parts of the materials, the fur settings and their placement on the mesh

04 Unwrap your model

To obtain your UV map, use the Unwrap tool. We're using this tool as it's perfect for working with organic models such as creatures and critters. For the Unwrap tool we need to specify the Edge Flow (cut). It's always useful to imagine how you will cut your model beforehand, as getting it right at this stage is vital. Our main task here is to obtain a high-quality map with multiple pieces and to get the minimum stretch. When your UV map is accomplished you need to package it. Try to do it on one UV map but use the U/V Tile Offset value equal to 1 or 2. For example, pairs will be 0-1, 0-2, 1-0 for each texture D.



F

G

06 Create textures

Use the Export UVs to EPS function to create a UV wire. Open the EPS file in Photoshop with 4,096 pixels. First look at reference images and imagine the structure of your painting. Get a red or orange base colour, then add surface noise for a better look. We'll paint on modo procedure textures, adding black and white areas as indicated by your reference images. Do not paint with Symmetry on because we need the model to be unique. Try to add further points with different layer styles and layer blending modes for various results F.

07 Create materials in modo

We need three main materials for the ladybird, leaf and water particles. The structure of the ladybird contains: Diffuse, Specular, Normal, SSS and Procedure maps and textures. You can see the Tree Material settings for the ladybird and leaf. Use a Material preset for the water particles. Moving to fur, duplicate all of your parts for the legs and body and move to the meshes. Use the Reduction tool if your geometry has high density. Go to the Paint tab and Hair Tools tab, then use hair guides and click on the mesh. Refer to the screenshot provided for the settings. We need to stretch our guides on the joints and the top part of the body. Add a fur material and move it to the top of the Shader Tree. This is very important because we will manually set Render options for the fur. Again, refer to the screenshot for the fur settings; I recommend Monte Carlo G.

UV mapping with UVLayout

UVLayout also has a powerful pack of options that allows you to place all of your parts inside different UV values:

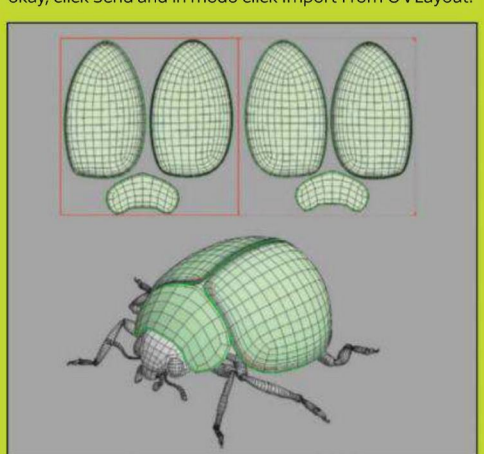
Step 1: You can use UVLayout as a standalone program or as a plug-in. Open the ladybird mesh in modo and run the UVLayout script. In the menu go to Type>Poly and UVs>New. Click Export to UVLayout.

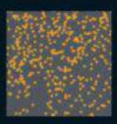
Step 2: The navigation and hot keys combination is the same as in Maya: LMB for rotating, RMB for zooming, MMB for pan. In the Display options in the Up option choose Y. Move your cursor to the edge and hit C to make a loop. This is called cutting, which is required when unwrapping the model.

Step 3: Select all cut edges, move the cursor to a different part and hit Enter (Separate) or Shift+S (Cut). This lets you cut or separate the model comfortably. When you've finished, you need to put all these parts in the UV Editor. Hold D and press 1 to move to the UV Editor.

Step 4: Move your cursor to a separated part and hold A until you like the result. You can also use Shift+F to flatten the separated part better. Open Pack, choose Best Quality and click Pack All. Don't forget to activate Tile UV!

Step 5: Hit 3 to see your unwrapped UV model. If all is okay, click Send and in modo click Import From UVLayout.



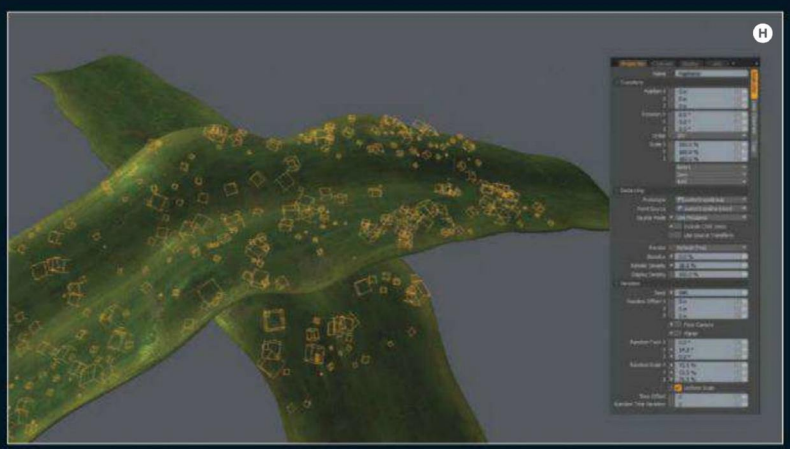


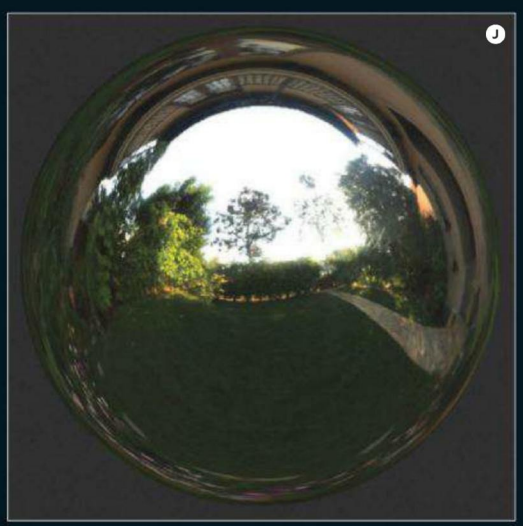
Lighting and particle effects

Create a lighting setup and add particles to the scene

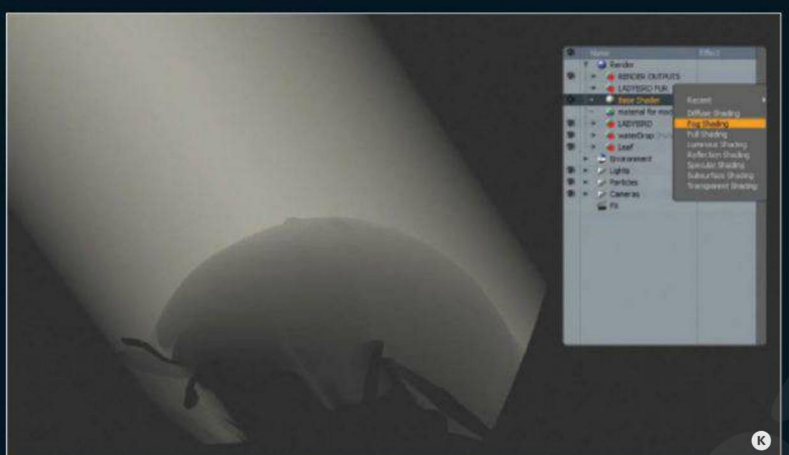
08 Work with Replicators To add water drops, copy your leaf polygons to a new mesh and triangulate them. We need to delete the bottom part of a water drop particle mesh. So delete the polygons under the legs, and the few that are deepest under the body, and then add a cube and smooth it. This will be our first water drop, so scale it on the Y-axis a little. Do the same again but use a different size and add a Replicator. Create a new group and add the water drop meshes to this group. Choose water drop meshes 1 and 2, and then hit 7 and move the Center position to the bottom. In the Replicator settings, set Prototype to the group name and Point Source mesh with leaf triangulated background polygons. See all the Replicator settings in the screenshot H.

09 Air particles Create a new group, call it 'air particles', and then add a very small sphere to your scene. Make an air particle mesh and apply a plane. Divide it a couple of times with fractals, select all the polygons and then press Back. Select all the points and turn on Noise Falloff with a 3-4% Scale. Move the points to up and down to make a randomised effect. In the new air particles material set No Diffuse and turn on Luminosity to white and value 1. Now in the Render Preview you can see particles with bokeh effects I.





10 HDRI lighting & camera settings We've taken a preset HDRI image from Luxology content. In the Environment tab add a new image with an HDRI. Use the Projection Type as Light Probe with Projection Axis Y, then use rotation to get a big composition result. To improve placement in GL Reflection, use Environment. Add a Minimum Spot of about 6-7 in order to texture. This brings some interesting blur to the image. With HDRI lighting we can capture beautiful global illumination lighting and self-shadows in our scenes. This map will also be visible in the water droplets to give us great results. Create a new render camera and place it in a position that you like. We're using about 150mm focal length and 6 Iris Blades. This is essential in order for the bokeh effects to work effectively J.



H The Replicator placement and settings used

I Placing air particles

J The HDRI map

K Volumetric render pass with the settings used

11 Add a volume light Add a directional (main) light source and place it in accordance with the HDRI map. All you need to do is gather specular and diffuse reflection to one point. Place it over the ladybird and turn on Volumetric Effect. This effect will be rendered separately from the main stage, as it will be much faster K.

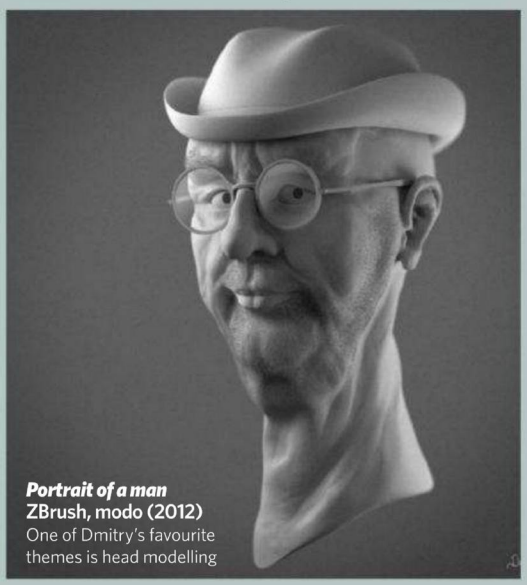
Use randomness in your composition to get even more realistic results

In the water drops' Replicator settings use a Render Density of about 20-30%. We don't need too many water drops because that will make our picture too heavy and more difficult on the point-of-view composition. Randomness is a very good solution for creating a good composition. Also, use the Seed option to get a good result. You can apply Vertex as a particle, but the particles won't be aligned with a background surface, so I'm applying Use Polygon as a Source Mode. For even better composition you can add water drop presets and manually place them on leaves.

Artist showcase

Dmitry Denisov

Currently working at the Kaspersky Lab as a web designer, Dmitry explores 3D as a hobby, spending most of his free time experimenting with various projects



Portrait of a man **ZBrush, modo (2012)**
One of Dmitry's favourite themes is head modelling

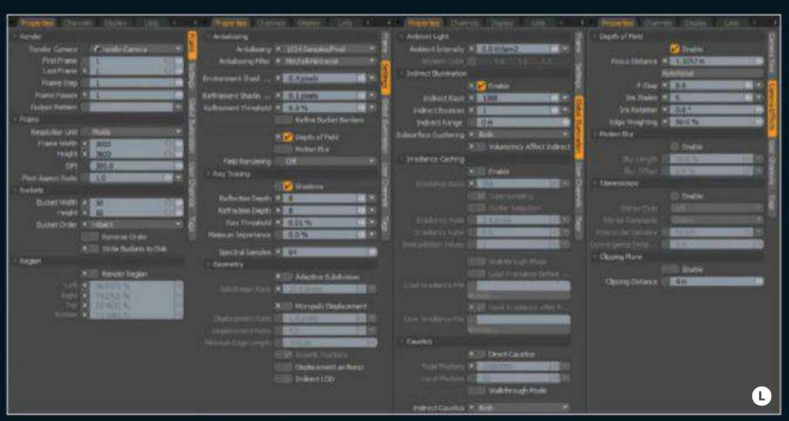
Sunday morning **Photoshop, modo (2012)**
The inspiration for this picture came from the Pixar movie, *Up*

To Windows 7 **After Effects, modo (2010)**
A still from the movie created for a Kaspersky Promo for Windows 7

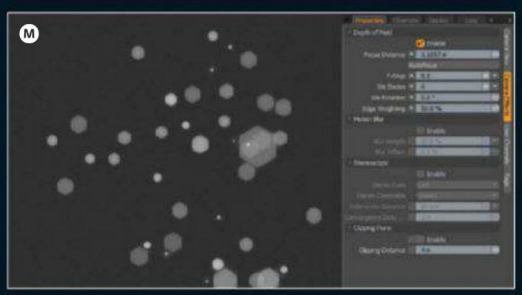
Rendering and post

Adjust render settings and make passes

12 Set up the render Organise your Shader Tree and create groups for all the model's parts. Remember that you can always add a Render Output for each part to help you in post-production. Choose all textures, set None to Antialiasing and Texture Filtering to Nearest. This is important as it gives more sharpness to our textures. Use Indirect Illumination type Monte Carlo and change Indirect Rays to 1,024. Set Antialiasing to about 256 or 512 samples, Mitchel filter, Refinement Shading to 0.1, Refinement Threshold to 0.3 and Ray Threshold to 0.01. Turn on DOF, set FStop to 8, Iris Blades to 5 and Edge Weighting to 50%. Check the screenshot for all the settings. This will be a first render pass with final colour and AO, but without Specular and Reflection passes (L).



13 Add bokeh effects We need to get another render pass with Reflection and Specular only. In the Render Camera change Edge Weighting to 98%. Never use maximum values, but rather 98.954, as this gives an interesting result. The value of 98% creates a real-world bokeh effect. Now, let's render our Specular and Reflection passes (M).

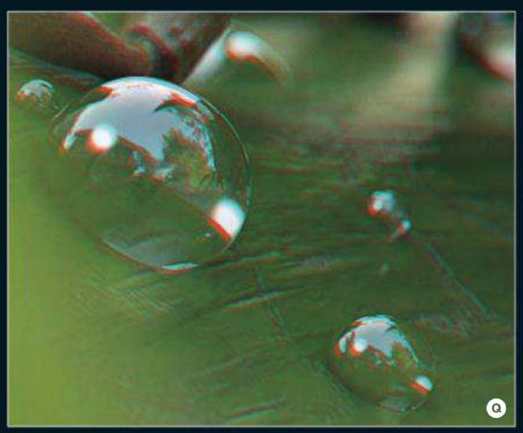


- (L) The main render and various camera settings
- (M) Bokeh settings
- (N) The Volumetric Light pass
- (O) The main render passes
- (P) Combining air particles and volumetric light
- (Q) Chromatic aberrations

14 Render volumetric light and air particles Choose the main shader, click RMB and set the Fog type, enabling us to render only volumetric lighting. You can also add different types of noise to Volumetric Density to get an interesting result. Try to find the optimal value of samples to get a suitable quality: 256-512 tends to work well. In Environment, set Visible to Camera to None. In Render Camera Settings I recommend using Edge Weighting with 50-70% to create a nice bokeh effect. Next, select the air particles group, isolate it from the scene and render it. These will be small particles with a bokeh blur applied (N).

15 Compare render passes in Photoshop Now we have a final Diffuse pass with all the lighting, AO, reflection, specular, volume light and air particles included. First duplicate the Color passes and blur them. Use this layer as a clipping mask for the AO pass, making our self-shadows much more interesting. Next add specular and reflection to produce a bokeh effect and use a blending mode to merge the two. Control the strength of these effects by adjusting the layer opacity. Remember you can decrease the strength of each pass by tweaking the Opacity or using Adjustment Layers. For example, you can duplicate the Color passes, blur and append them as clipping masks to the Reflection or Specular pass with Opacity set to 15%, and an Add blending mode O.

16 Even things up a bit Now we need to add some volumetric lighting and air particles. Above all the layers apply your volumetric light, set to the Screen blending mode. An Add blending mode can give you better colours, mixing with the background layers. Adjust the Opacity and Adjustment controls to affect the layer strength P.



17 Colour correct the image For colour correction I recommend using a solid colour (blue) with Screen blending mode and Opacity at about 20-30%. This gives us a nice tone and atmosphere. Duplicate the image, flatten all the layers and go to the Channel palette. Choose the Red channel and move them by one or two pixels to the left and bottom. Duplicate this layer to your main scene, put it on top and set the blending mode to Color. You'll be able to see chromatic aberrations. To add a magical look to the scene, hit Cmd/Ctrl+Opt/Alt+Shift+E and duplicate this layer. Finally, add some blur, set the blending mode to Screen and finish up by decreasing the Opacity to 10-15%. And you're done! Q

To get a higher-quality result we can use layers for each mesh and manually add them to the compositing program
15+ hours
creation time
Resolution:
3,000 x 3,800

Under the Southern Highway 2012

I've tried to capture some sort of greyness of life. As a man gets older and older as he starts to burn down, slowly. Tired of the world and its ridiculous[ness], looking around and seeing things that I've never noticed or needed to notice before as life goes on day after day and the priorities of everyday life are changing. Just for the record, this is not meant to be some sort of protective image of mothers or old architecture, but the coalition/composition of slightly contrasting elements that do exist together and create special places.

Software used in this piece

3ds Max · V-Ray · Photoshop

I made this...

Incredible 3D artists take us behind their artwork

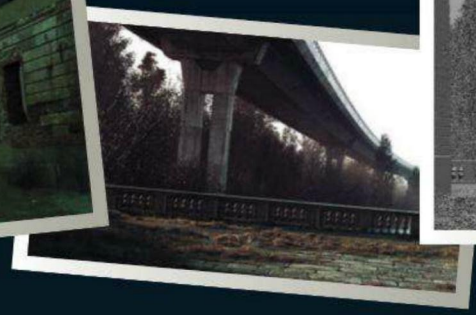
Artist info

Marek Denko

Website www.marekdenko.net, www.noemotion.net
Country Slovak Republic
Software used 3ds Max 2012, V-Ray, Photoshop
Bio Marek founded NoEmotion Studio in 2007.

"I rendered with the great Chaos Group V-Ray renderer. Colour correction was done in Photoshop"

"The whole scene was created as models. No photography [was] used – all modelling and texturing was done in Autodesk 3ds Max 2012"



"I used VRayEnvironmentFog directly in the render, so the render time was a little higher, but it was completely worth it. No extra plug-ins were used"

BALLISTIC PUBLISHING'S

MASSIVE BLACK

VOLUME TWO

For close to a decade, concept art studio Massive Black has created artwork, illustration, and animation for some of the biggest games, movies, and TV shows known today. This book is the second volume of their work available in print.

Silent Hill, Young Cheryl, Wes Burt, Massive Black

/ B A L L I S T I C /

Software used in this piece

ZBrush

Photoshop

Learn how to

- ☑ Sculpt fabric folds
- ☑ Model stylised hair
- ☑ Rough out a stylised tree
- ☑ Compose a unique character for an illustration

Concept

The idea behind this illustration is to create a unique fantasy character – I've decided to concept a female spirit of a tree. I want to achieve a very sculptural, stylised look to the image, inspired greatly by ancient Greek mythological character sculptures.

Sculpt folds and fabrics

Dryad – Spirit of a Tree 2012

"The goal of this image was to create a stylised, sculptural, fantasy character with a focus on showcasing the dress folds, the hair and the tree branches in the design and creation process"

Andrzej Kuziola is a freelance illustrator and 3D artist – and he loves it! Besides illustration and 3D work, he also writes tutorials and training material for artists

In this tutorial we will explain the design and creation process of a fantasy character showcasing the features in ZBrush. We'll explore various ZBrush tools and show how helpful they are to visualise ideas and achieve great effects. ZBrush gives the freedom of creation in any workflow, enabling you to experiment and visualise ideas.

This tutorial will explain how to design and create a character from scratch, showing important considerations along the way while explaining the workflow and various techniques used. We will focus mainly on sculpting the fabric of the dress, the character's hair and some stylised tree branches to finish.

behind the scenes

3D artists explain the techniques behind their amazing artwork

Artist info

Andrzej Kuziola

3DArtistonline

Username: ak666

Personal portfolio site
www.kuziola.com

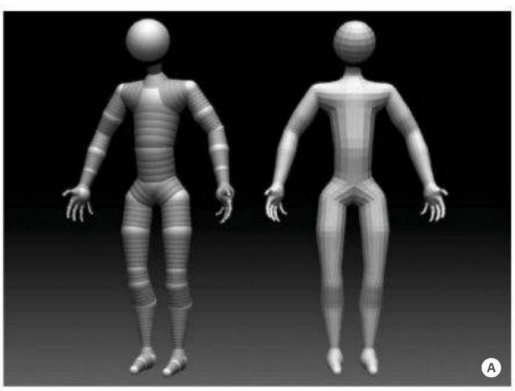
Country Edinburgh, UK

Software used
ZBrush, Photoshop

Expertise Andrzej Kuziola specialises mainly in character creation, from concept to render, and detailed 3D model creation

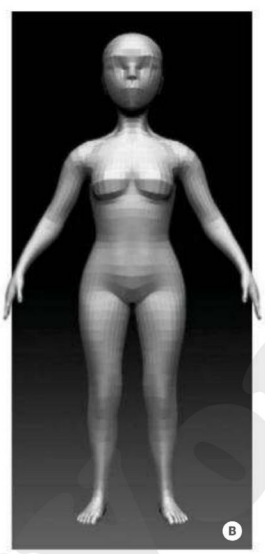
Create the body with ZSpheres

Let's begin by creating the character in a neutral pose

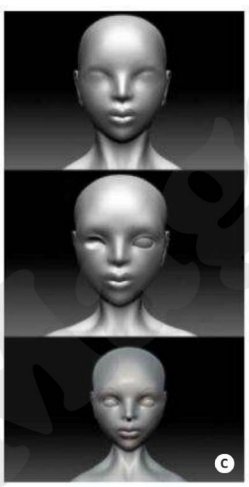


01 Establish your base mesh Using ZSpheres, create an initial armature and block in the shape of the character. In these early stages we won't draw ZSpheres in place of the eyes and mouth. Primarily, we'll focus on proportions, as this will give us more design freedom in the later stages. When happy with the result, change the rig to Adaptive Skin, then press the Make Polymesh3D button A.

02 Sculpt the body Modify the shape of the mesh with the Move Topological brush and start defining masses with the Clay, Clay Tubes, Simple and Smooth brushes. Work gradually from the lower subdivisions to the higher levels, subdividing the mesh when necessary and trying to get as much detail as possible on the lower polygon densities. Focus mainly on the head and hands, because the rest of the body will be covered with clothes. As we're going to create a stylised character, change proportions by exaggerating the head and elongating the limbs. Do this with the Transpose tool and the Move Topological brush B.



03 Detail the face Pay the most attention to the face design, especially the eyes and lips. Switch the model to a high subdivision level, then sketch the shape of the eyes and the lips with the Pinch brush. Create eye sockets with the Clay brush and shape an interior with the Smooth brush. To sharpen eyelid edges use the Pinch brush with a very small Draw Size. To create eyeballs, append a sphere as a SubTool, adjust its size, position and then mirror it to the second eye socket. With the character base mesh active, use the ZProject brush on the eyeballs. Thanks to that we've now got spheres projected into the eye sockets, so we are able to delete the eye SubTools C.



A When working with ZSpheres you can preview Adaptive Skin by pressing the A key

B Block in the main muscle masses and establish the character's proportions

C Use Slash 1 and Clay brushes to add details to the lower lip

Why model the whole body?

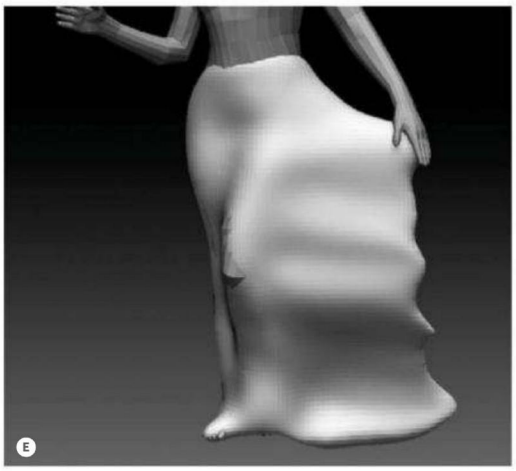
I've chosen to create whole body anatomy – even though most of it will be covered with cloth – for two reasons. The first is so I can reuse the model in my future projects. Keeping a repository of base meshes and models gives a huge advantage when a deadline is short and you don't have enough time to create something from scratch. The second reason for creating the whole body is that the clothing process is much easier with body armature underneath. Besides these, it's always good to practise sculpting human anatomy when you have the opportunity.

Design and composition

Establish composition and block general forms for further development

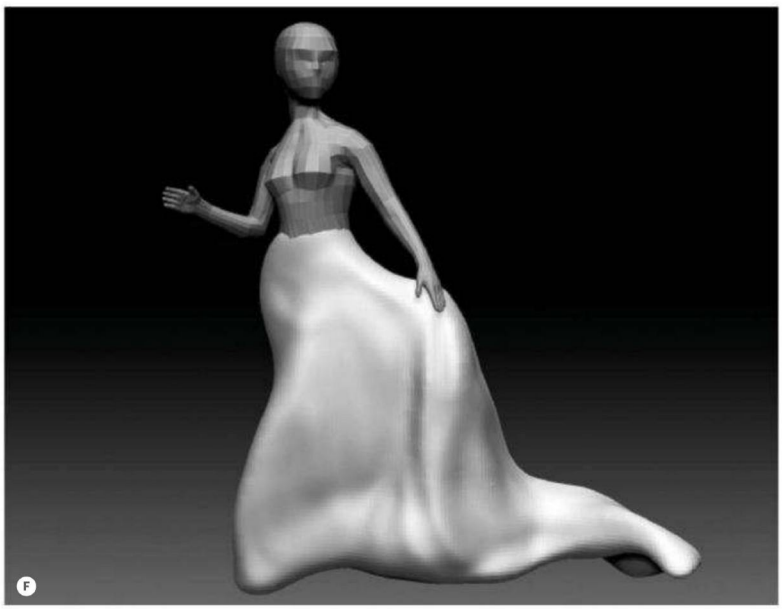
04 Pose the character Pose the character with the Transpose tool and then fix deformations with the Move Topology, Clay and Smooth brushes. In this case it's not necessary to adjust body distortions in some areas due to the fact that they will be covered with a dress, but here we've done it for the purpose of the tutorial. We want to create a neutral, balanced and relaxed pose. This is a framework for the cloth anchor points and will help us establish interactions between the body and the clothes D.

05 Create the base of the dress To create a base for a dress we're going to use DynaMesh. As a starting point we want a mesh that matches the shape of the legs as much as possible. This will help us establish interaction between the fabric and the body later. To do so, first duplicate the character, then extract the bottom part of the mesh by partially hiding it with Cmd/Ctrl+Shift, the Delete Hidden and Close Holes options. Convert it to DynaMesh and start reshaping it with the Move Elastic brush. For smaller areas, use the Move Topological brush. Also start to use the Standard brush with a large Draw Size to sketch the direction of the folds E.



Principles of good design

There are a few golden rules that you need to follow if you want to create a really impressive illustration. First of all you need an interesting focal point to pull in the viewer's eye. You also need to design and place elements in your image in such a way that the viewer's eye will flow around the various details. Creating rhythm and variety in your image to keep it balanced is important. Always think about positive and negative space, and also about the relationship of light and dark.



06 Refine the dress Activate the DynaMesh function by clicking its button. This creates a new uniform topology with the density defined by the Resolution slider. Always start with a lower resolution and then adjust it to achieve the desired result. Each time polygons become stretched after adjustments to the mesh, recalculate DynaMesh by hitting the Cmd/Ctrl key and dragging the cursor onto an empty canvas F.

D Use the body as a framework for cloth anchor points

E Start shaping the dress with the Move Elastic brush

F Always start with a lower resolution and then adjust it to achieve the desired result

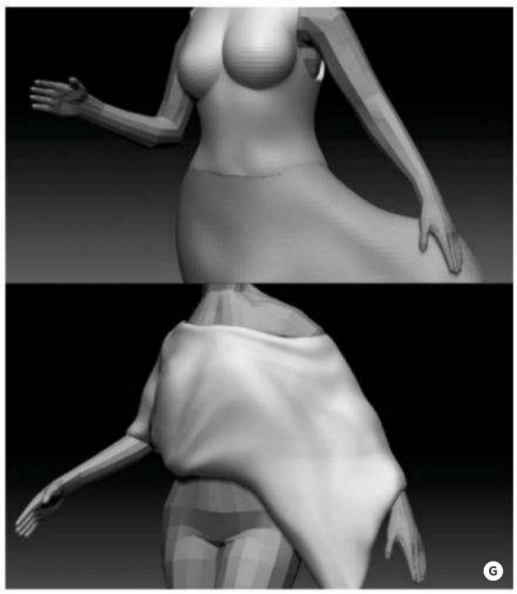
Artist Showcase

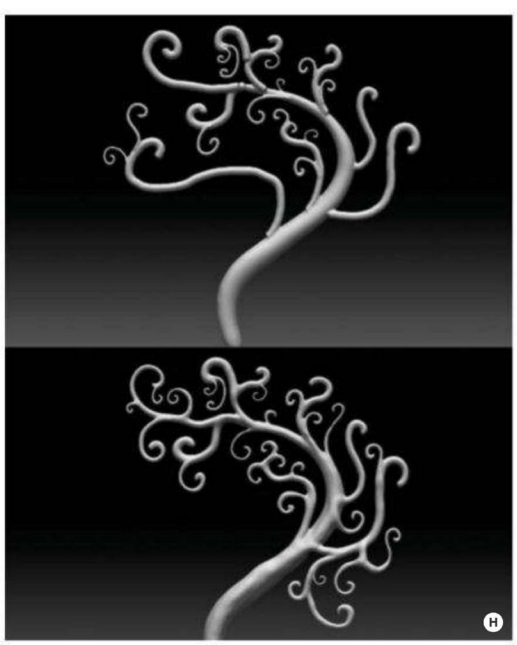
Andrzej Kuziola

Andrzej is a self-taught digital artist based in Scotland. He originally qualified in dentistry, but decided to give it all up for a career as a freelance illustrator and 3D artist. ZBrush, CINEMA 4D and Photoshop are now his daily tools to help him create realms that would otherwise exist only in his mind.

Wild at Heart **ZBrush, Photoshop (2012)**
This illustration is inspired by a woman blessed with a truly wild heart and a passion for nature. It's a very personal image, packed with symbolism

Tattoo Goddess **ZBrush, Photoshop (2011)**
A T-shirt design created for Rock'n'roll Tattoo and Piercing studios in Scotland. The image was also published in *EXPOSÉ 10* by Ballistic Publishing





07 Move to the top To create the top of the dress we'll use DynaMesh again, but in a slightly different way than previously. Mask the area that you want to use for a new SubTool. Go to SubTool>Extract, adjust Thickness and choose Accept Extraction. This is a good way to create a mesh around a complex shape. Now start to reshape a new mesh, using the Move Elastic, Move Topological and Standard brushes to add volume and block large folds. Remember that DynaMesh needs some thickness. When you get artefacts after re-calculation, undo the action and work on the area with the Inflate brush G.

08 Design the tree Create a curved tree trunk with ZSpheres, adjust its shape with the Move Elastic brush, then transfer it to DynaMesh and start adding branches with the Curve Multi Tube brush. This is a great tool for elongated, tentacle-like structures. Re-calculate the mesh often and also use the Inflate, Smooth, Move Topological and SnakeHook brushes. This sketch-like workflow is a good way to create designs and develop ideas straight in 3D without an initial sketch H.

09 Create the background Now we'll add a background that will play two roles. First it will show the final image proportions that will consequently help establish an effective composition. We're also going to use the background plane as a basis for the hair – but first we need to add some dimensionality to it. Use the Move Elastic brush to create a recess behind the character, then move a part behind the head towards it and the bottom edge towards the viewer to create some ground. After that, sculpt the whole plane with the Clay Tubes brush, then equalise it roughly with the TrimDynamic brush and Morph Target I.

10 Sculpt the hair Now we can start sculpting the hair with a modified Slash 2 brush. Sculpt the hair strands with loose and smooth strokes on a separate layer. Our goal is to create an effect of hair filling the background and turning into it. We also want the hair to be tangled with the branches. At the end, decrease the layer's intensity and gradually work with the Morph brush to create a smooth transition between the strands and the background material. For the loose hair strands, append a sphere and move it to the head area, also using the DynaMesh and Curve Multi Tube brushes. After that, flatten the strands with the TrimDynamic brush and finish with the Standard brush with Alpha 38 and Lazy Mouse options turned on J.

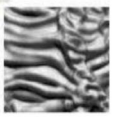
The Discreet Charm of the Butapren **ZBrush, Photoshop (2012)**
Andrzej says: "Butapren causes brain damage; bioluminescence is the production and emission of light by a living organism"

G Remember that DynaMesh needs some thickness

H The Curve Multi Tube brush is a great tool for elongated, tentacle-like structures

I Open a new document with the dimensions of the final illustration and then use Transpose tools to adjust its size to the dimensions of the canvas

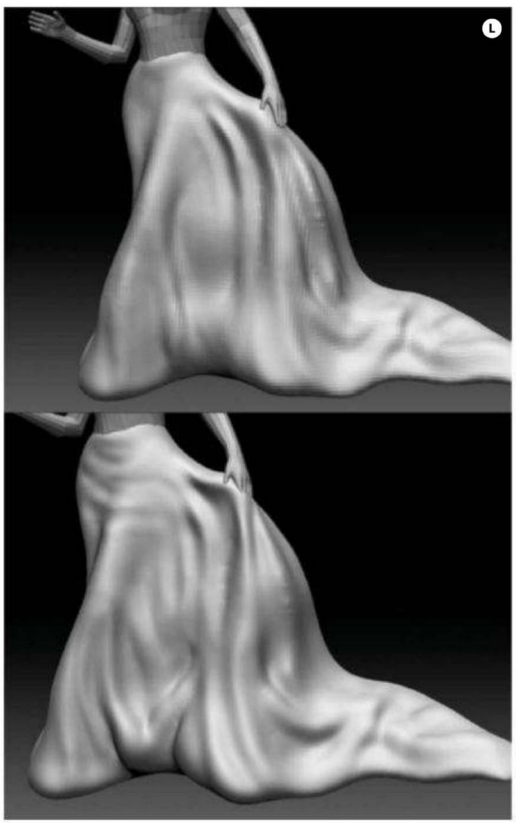
J You can find the Slash 2 brush in Light Box>Slash Brushes



Add the fine details

Create a winding tree and realistic cloth elements

11 Detail the tree Go back to the tree and develop it further. Use the Curve Multi Tube brush to add roots and vine-like structures. The Draw Size determines the diameter of tubes created by the brush, so work here with a smaller size. When a tube is painted you can adjust its location and shape. It's possible to draw multiple tubes at once but it's handy to update DynaMesh after each added tube. Also increase the DynaMesh Density to keep all the new details. When you're happy with the form of the tree, quit DynaMesh and start detailing with the Clay, Clay Tubes, TrimDynamic and Dam_Standard brushes K.



12 Add some wrinkles Start sculpting wrinkles and folds on the bottom part of the dress. Begin working with the Standard brush without any Alpha loaded and with Lazy Mouse mode turned on. Begin to add volume with the Inflate brush, using it lightly with low pressure. Also adjust the brush's Gravity Strength and start using Alpha 38 for the finer wrinkles. Work with smooth, loose brush movements, relying on your own intuition and experience. During this process, smooth and sculpt again until you get the shapes you want. You can also switch between ZAdd and ZSub modes L.

13 Refine the curls Now move to the top part of the sculpt. Initially the workflow and brushes are the same as in the previous part, so create some horizontal folds with the Standard brush. Mainly use Alpha 38 here and turn Gravity on and off in the Brush>Depth menu to check your work. To create vertical patterns, use the Clay brush and then develop it further with the same Slash 2 brush used earlier. Refine the shape of the curls with the Move Topological brush and add some more volume to the horizontal folds using the Inflate brush M.

Crinkle and fold effects

To create believable wrinkles or folds you need to keep in mind a few factors such as the interactions of folds and the forces generating wrinkles like kinetic energy and gravity. You need to know where to place anchor points – areas of retention on a body – where wrinkle systems will originate. I highly recommend the book *Dynamic Wrinkles and Drapery* by Burne Hogarth, where you can find all this information. It's also a useful source for great references.

K Increase the DynaMesh Density to keep all the new details

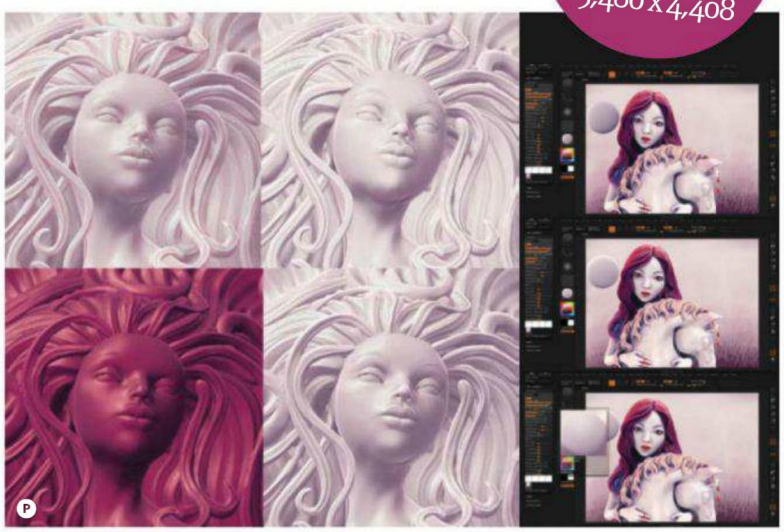
L Increase LazySmooth, LazyRadius and adjust LazyStep for smoother results

M Use Alpha 38 for finer wrinkles

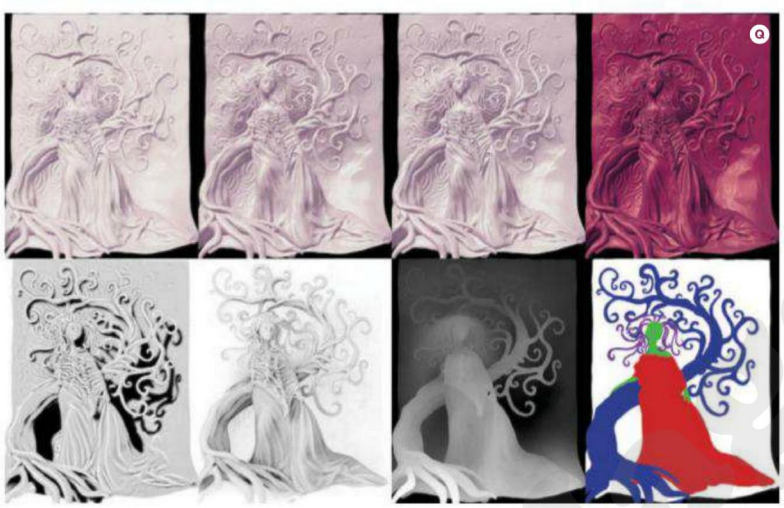
Finishing touches

Finalise the model and render it for illustration

24 hours creation time
Resolution: 3,480 x 4,408



14 Complete the dress Add more volume to the folds with the Inflate brush and pull down some parts that are lacking in gravity. Fine-tune the creases with the Standard brush and Alpha 38, then use the same brush with a very small Draw Size to add some texture to the fabric. Work with different Gravity settings and adjust interactions between the wrinkles. See how they react to kinetic and gravity forces and then tweak the overall flow N.



15 Facial expression Our goal is to show that our Dryad enjoys the presence of a tree (she's the spirit of a tree, remember). To change her neutral facial expression to something with more character, firstly re-sculpt her eye a little to a half-closed, sleepy shape. Mask the lower lid and lower half of the eyeball with the Layer brush and then work on upper parts of the eye with the Clay brush. When the upper eyelid is lower, use the TrimAdaptive and Smooth brushes to create the correct curvature of the lid. To finish, use the Pinch brush to sharpen the edge. To create an elusive smile, decrease the model's subdivision and use the Move Topological brush to move the corners of her mouth slightly O.

16 Apply materials I'm going to re-create materials from a similar, older illustration. Before we start sampling information we need to prepare our tools. Choose a Plane primitive, convert it to Polymesh3D, draw it on the canvas and enter Edit Object mode. Choose a Flat Color material, then in the Texture menu import an image to sample information from and add it as a texture to the Plane. Drop it on the canvas and choose a sphere – an object to check the new material. Draw it on the canvas in Edit mode beside the Plane and choose MatCap White Cavity material from the ZBrush library. Pick the MatCap tool and start sampling from the illustration reference. Click the image and drag the cursor until a red arrow points outwards. Repeat this several times, bearing in mind the direction of the facing surfaces. When happy with the colour, hit Cmd/Ctrl and start grabbing the highlighted areas. Doing this we can create specular highlights P.

17 Create illustration Use Best Preview Render to render the image in a few separate passes: different MatCap materials, Ambient Occlusion and Shadow from one main light source. Fill each SubTool with a different colour and render it with a Flat Color material – it will be the mask for easy separation of each SubTool for post-production. In Photoshop, apply a layer mask to each rendered MatCap layer and experiment with different material configurations. To finish the illustration, import a Shadow pass and Ambient Occlusion and set them to a Multiply blending mode with customised opacity Q.

Practise makes perfect

At the beginning, without knowledge of fabric dynamics, it is very difficult to sculpt believable folds. I recommend studying as many references as possible, observing different kinds of clothes, studying sculpture works – even taking photos of varied fabrics in different configurations and then trying to re-create them digitally. The more you practise, the more believable your effects will be. When you understand folds you can create any fabric without relying on references. It's vital *not* to focus on one area at a time; first establish larger folds, their direction and placement, and keep in mind fabric qualities and gravitational forces.

N Be sure to check the flow of the folds looks realistic

O The Layer brush is best for masking due to its handy pre-loaded Alpha

P Use the Wax Modifier for a translucent effect

Q Render the images for illustration with Best Preview Render and the highest Antialiasing Quality

GNOMON
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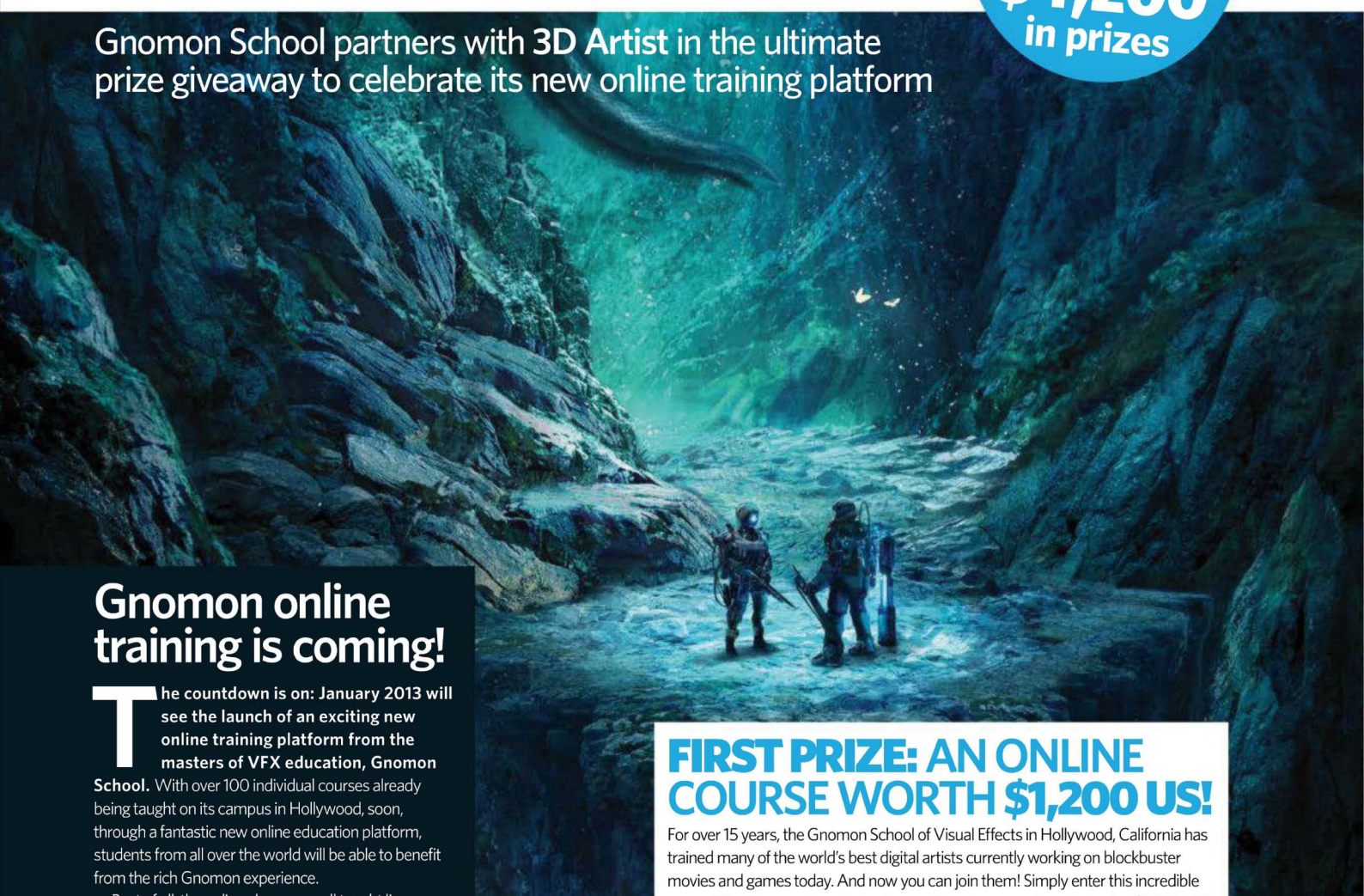
WIN A GNOMON SCHOOL LIVE ONLINE CLASS WORTH $1,200 US

Win! Over $4,200 in prizes

Gnomon School partners with **3D Artist** in the ultimate prize giveaway to celebrate its new online training platform



Gnomon online training is coming!

The countdown is on: January 2013 will see the launch of an exciting new online training platform from the masters of VFX education, Gnomon School. With over 100 individual courses already being taught on its campus in Hollywood, soon, through a fantastic new online education platform, students from all over the world will be able to benefit from the rich Gnomon experience.

Best of all, the online classes are all taught live, structured identically to the in-person tuition that students get on campus. This is exciting news for anyone who's dreamed of learning from the best in the heart of Los Angeles. Whether you want to learn new skills from the pros, sharpen up your knowledge of the tools already in your belt, or generally further your experience in the industry, Gnomon can help. It's a simple setup, too: students will meet for three hours per week for a period of ten weeks. That's ample time to get your head around new tools and subjects, liaise with your tutors and sharpen up those mean skills to secure that dream job! More information will be hitting the Gnomon School website throughout November – visit www.gnomonschool.com to stay up to date.

FIRST PRIZE: AN ONLINE COURSE WORTH $1,200 US!

For over 15 years, the Gnomon School of Visual Effects in Hollywood, California has trained many of the world's best digital artists currently working on blockbuster movies and games today. And now you can join them! Simply enter this incredible competition for your chance to win an online course worth a staggering $1,200 US!

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If you don't win the first prize, don't fret! There are plenty more goodies up for grabs...

Caught up in the excitement of a new online training platform from the Gnomon School, the Gnomon Workshop has added thousands of dollars to the prize bill. This means there are plenty of opportunities for you to get your hands on the good stuff! Here's a quick breakdown of all the glorious prizes you can get your mitts on:

SECOND PRIZE:

One lucky individual will get **25 DVDs** from the Gnomon Workshop library. Worth **$60 US** each, this is a massive **$1,500 US** prize!

THIRD PRIZE:

The fun doesn't stop yet! Our third winner will receive **15 DVDs** from the Gnomon Workshop library, equivalent to **$900 US** worth of training!

FOURTH PRIZE:

The fourth winner will get to take **10 DVDs** from the impressive Gnomon Workshop library, worth **$600 US**. That's still an amazing hoard!

RUNNERS UP:

If that's not enough, five runners up will be sent a stunning **Gnomon T-shirt** from Gnomon's prestigious apparel collection. Wear it with pride!

HOW TO ENTER!

For a chance to win top prizes, answer this simple question...

Join in the celebrations of the Gnomon School's new online training platform by answering the following question:

When does the new Gnomon School online training platform launch?

To enter, simply head to **www.3dartistonline.com/competition** and submit your answer by following the links to the Gnomon School competition.

All images courtesy of Gnomon School

A Student work by Dong Kyun Ryu created while studying at the Gnomon School of Visual Effects

B Learn to create this character with the Character Design and Modeling for Next-Gen Games Gnomon Workshop DVD by the talented Vitaly Bulgarov

C *Dirge* is one of Alex Alvarez's personal creations made using Maya, ZBrush, Photoshop, mental ray and After Effects

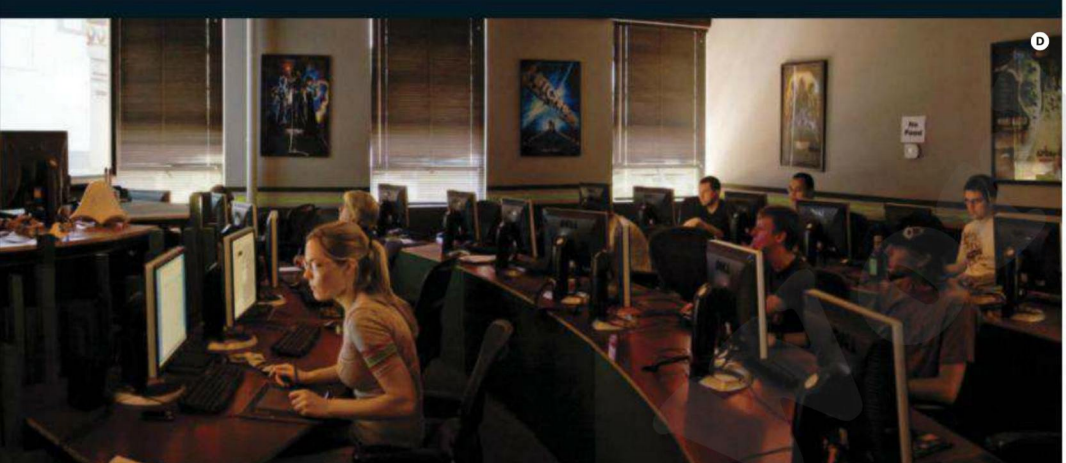
D The impressive labs at Gnomon School were all designed in Maya!

TRAINING WITH GNOMON WORKSHOP

How thousands of people have benefited by learning from Gnomon in DVD format

Since 2000, the Gnomon Workshop library of over 300 educational DVDs has provided students and professionals with the fantastic resources they need to succeed in the entertainment industries. With an extensive range of titles produced by renowned artists, the DVDs can be found all around the world on the desks and shelves of studios, universities and thousands of aspiring artists.

While it's difficult to sum up the sheer volume of talent that has contributed to the Gnomon Workshop DVD library so far, we can highlight a few of the exceptional names that have taken the time to share their workflow through video format, including: David Lesperance, Jeremy Cook, Josh Nizzi, Raphael Lacoste, Vitaly Bulgarov – and let's not forget the one and only Alex Alvarez, founder of the Gnomon experience. Find out more at www.thegnomonworkshop.com.



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With the Disc

- Cloud and fog brushes courtesy of FanExtra.com
- CGAxis HDRI worth $15 US

Plus tutorial files:

- JPG textures
- MAX scene file
- Tutorial screenshots

Learn how to

- ☑ Create complex V-Ray materials for your scenes
- ☑ Manage multiple light sources efficiently
- ☑ Deal with render elements
- ☑ Confidently render effects and atmosphere
- ☑ Tackle post-production work in Photoshop

Software used in this piece

3ds Max · V-Ray · Photoshop

Concept

The concept is a representation of the history of architecture from 400BC to the turn of the 20th Century. I wanted to create an illustrative look and feel to the image, as well as try to create a dynamic multiple-point lighting setup.

Perfect your arch-vis scenes

Arch history tower 2012

With the structure modelled using scripts in 3ds Max, we'll now create an illustrative render and set the scene in a surreal, mysterious dusk environment

Chris Kowal works as an artist specialising in 3D visualisations

Last issue we learned how to model this intriguing tower structure, inspired by various eras of architecture from history, using scripts.

This second chapter will continue the arch tower with a look at how to create complex shaders in V-Ray using the VRayDirt map. We will also look at how to set up an effective lighting scenario for the scene, which will include a setup with multiple lights to create an atmospheric effect. We'll then take a look at V-Ray render elements and how to render different layers, before finishing up with a post-production lesson in Photoshop, showing how to make the most of your rendered elements.

behind the scenes

3D artists explain the techniques behind their amazing artwork

Artist info

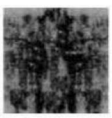
Chris Kowal

Personal portfolio site www.chriskowal.com

Country Canada

Software used 3ds Max, V-Ray, Photoshop

Expertise Chris primarily works in architectural visualisation. Though he's interested in most styles, his work focuses on photorealistic images.



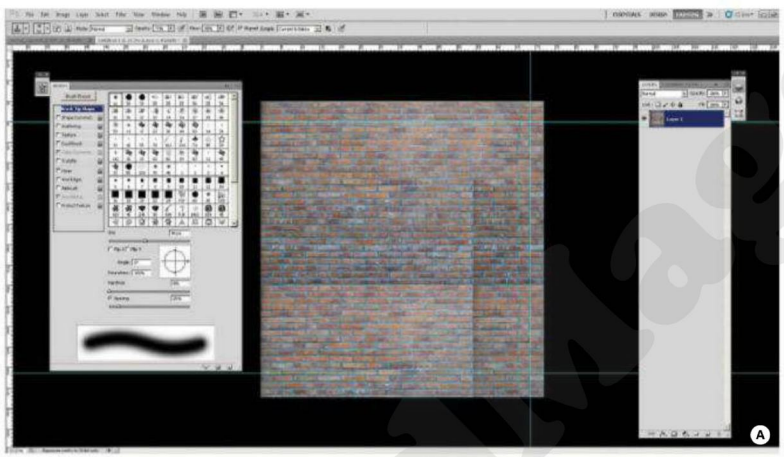
Perfect your materials

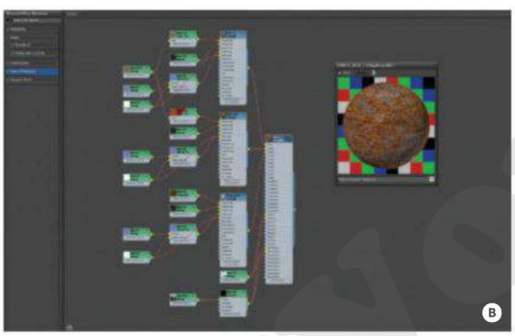
Learn how to create complex V-Ray materials in 3ds Max

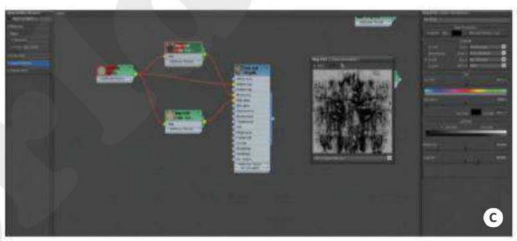
01 Create tileable bitmaps You can create tileable bitmaps from just about any image. Start a new Photoshop file and make the image 2,048 x 2,048 pixels. Now copy your image into the new file you created and re-size its proportions to fit the canvas. Copy the image to fill up the canvas and crop the excess image outside the limits. Now you can set up guidelines to distort the image and make sure the perspective is correct, then crop again. Go to Filter>Other>Offset and offset the image to 1,028 x 1,028 pixels. Clean up seams using the Clone Stamp A.

02 Make a brick material Using V-Ray, start with a basic V-Ray material. Put a Color Correction map in the Diffuse channel so it can be repeated. Once you create this, make a copy of the material. Now you can adjust the Color Correction map to something different from the original. Create a VRayBlendMtl then plug your original Brick material into the Base node. You can now plug the duplicate material into the Coat material. This can be repeated to create layers of blended materials. You can opt to control the blend even more with a VRayDirt map and a bitmap in the Radius slot B.

03 Generate a worn metal effect You can stretch a single bitmap throughout the material by using the Color Correction map that comes with 3ds Max. Once you create a tileable texture, load it into the Material browser. You will then be able to connect that to the Reflection map, the bitmap and others by using Color Correction maps C.







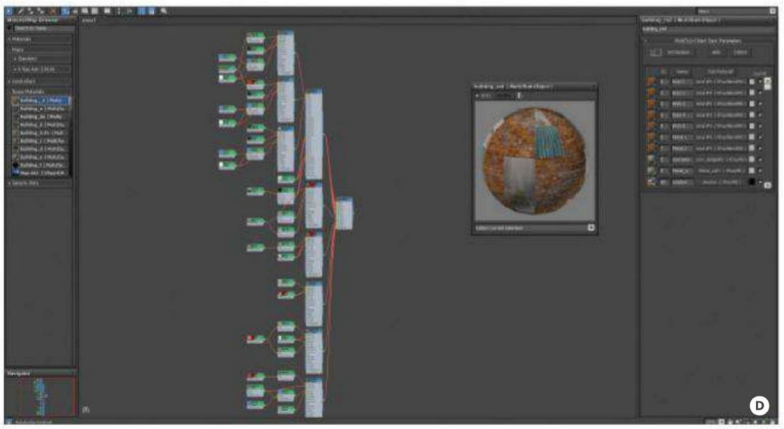
A A look at starting the brick material in Photoshop

B Some of the material settings and the tree nodes

C The variations in the metal material settings

Set the scene

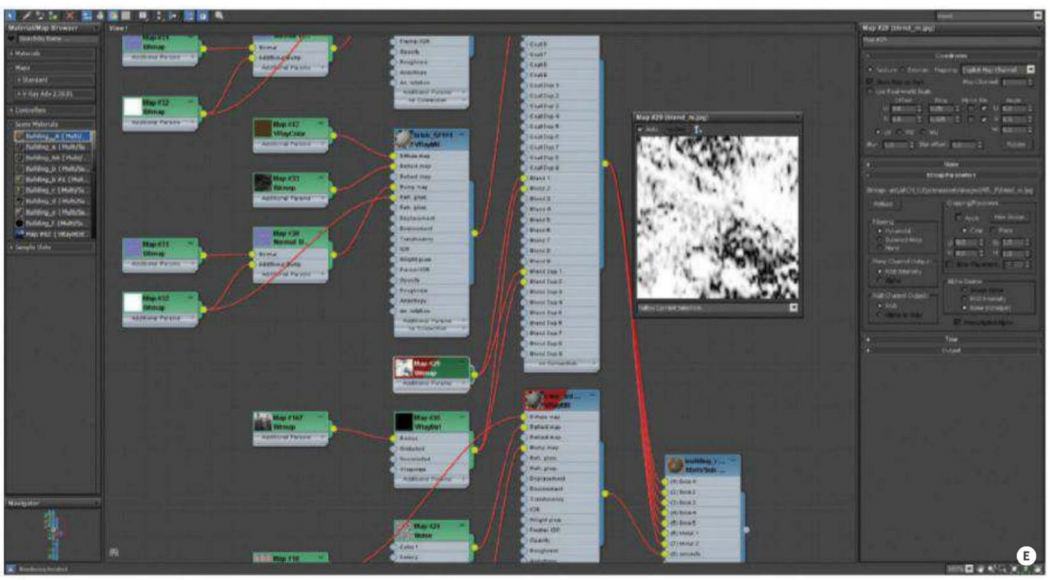
Add your materials and set up the lights



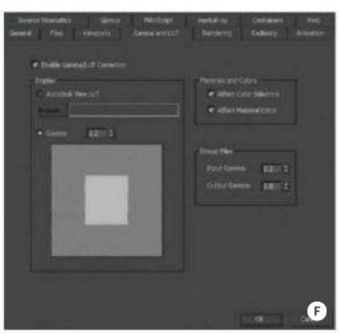
04 The Multi/Sub-Object material Now that we have our materials built we can select one of the buildings we have made. In the Scene Material window we can drag the building's selected material and make an instance of it in the View window. Now delete the standard materials attached and reconnect the V-Ray material previously created D.

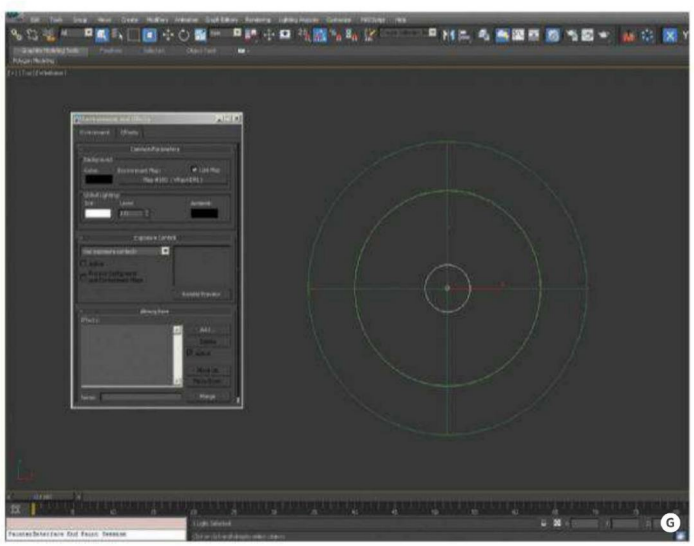
05 UVW map the buildings Now you can activate Show Material in the Viewport so you can see the bitmaps on the model. Select the Multi/Sub-Object material, then select the number that corresponds to your brick. Add a UVW modifier to this and adjust the mapping to create the look you want. Now collapse the stack back to a poly and repeat the process for other elements like the roof or the cornice E.

06 Set up the Gamma I want to include this step just in case anyone has not done this from the previous chapter of this tutorial (issue 47). Open your Preferences then select the Gamma and LUT tab. Set your Gamma to 2.2, Input Gamma to 2.2 and your Output Gamma to 1.0. Tick the Affect Color Selectors and Affect Material Editor options F.



07 Add some light with an HDR file It's now time to add a little light to the scene. Place a Dome VRayLight in your scene and set the Multiplier to 1. Load a V-Ray HDR file into your Material browser and then load an HDR file into the chosen map. You can now place it in the Texture slot of your Dome light. Next, make an instance of this and add it to the Environment slot G.





D A detailed view of the Multi/Sub-Object material building tree

E The final mapping of one of the buildings in the structure

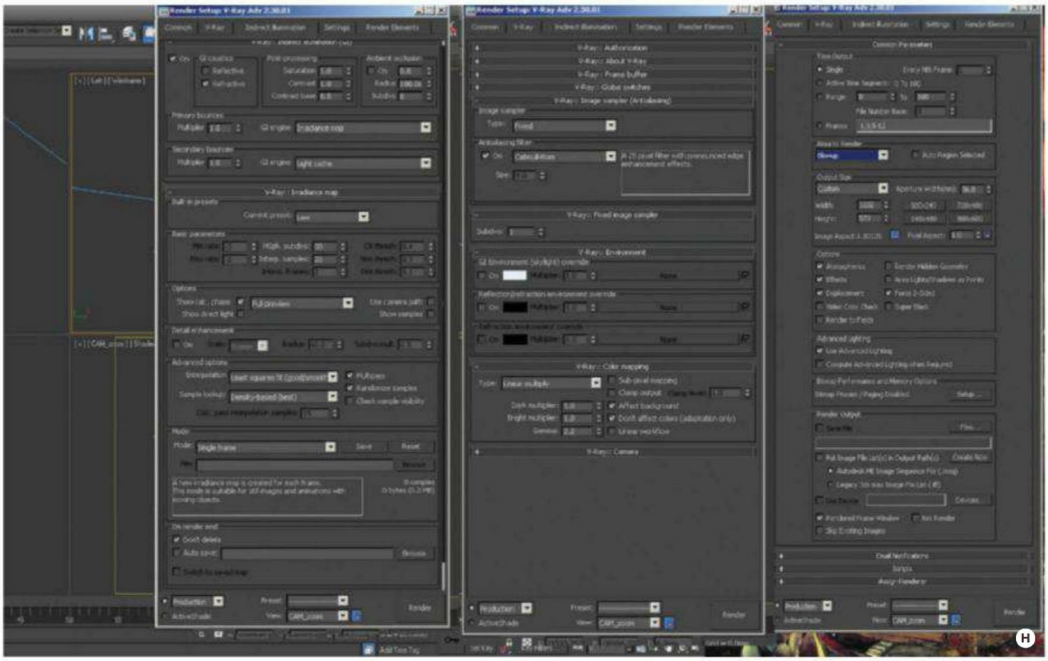
F Screen settings for the gamma setup to use as reference

G Set up your lighting by importing a V-Ray HDR file into the Material browser

Free bitmaps

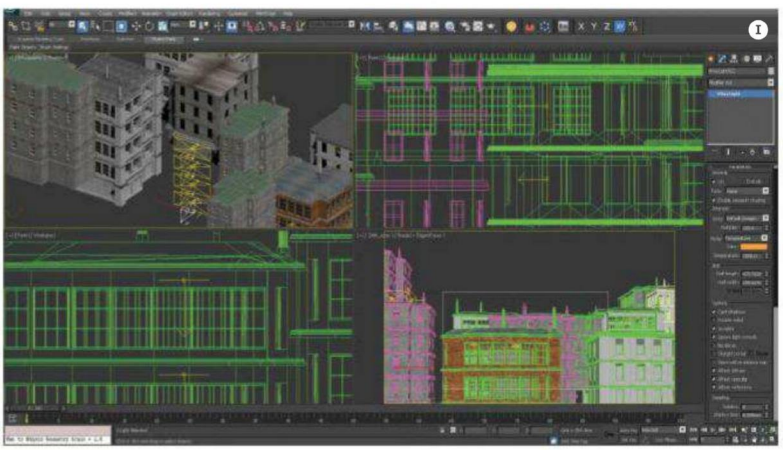
Sourcing royalty-free or non-commercial use resources is essential for any 3D artist. There are places like 3DTotal's Texture & Reference Image Library (**http://freetextures.3dtotal.com**) and CGTextures.com. There are also blogs and sites that give away textures and HDR files as well as tutorials and tips. A few great resources that all 3D artists should have included in their bookmarks are:

- ronenbekerman.com
- www.pixela-3d.com
- bertrand-benoit.com
- peterguthrie.net
- surrealstructures.com



Lighting design

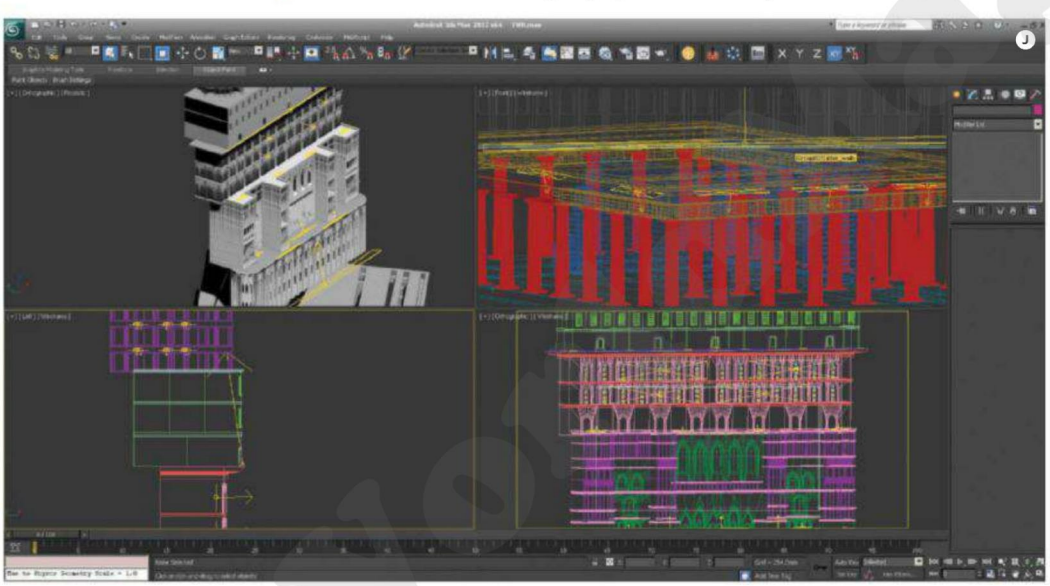
When looking at lighting and its design, I feel that the temperature of colours being used is an extremely important aspect. It's such a simple thing that can be easily overlooked, but it's almost the first thing I consider in setting up my lights for a scene. I ask myself: what is the overall colour temperature of the image? I consider the time of day, what that means to the light and how warm or cool the general lighting will be. I will then be aiming to complement that general lighting. You should carefully decide on output levels and the directions of that output.



08 Set up a test render To begin, first copy your V-Ray camera. This will be your test camera that you can move and zoom with. Set the Exposure to the real-world settings using an online exposure chart. Increase the Render Multiplier in the HDRI map. This will control your world GI. Set your Render AA and Indirect Illumination options to Low. Another excellent time saver is to change the Area to Render from the drop-down to Blowup. This enables you to render selected regions in the frame. The longer you spend testing the better, so take your time H.

09 Light up the buildings Next we'll create VRayLight Planes to light the buildings. Instance every light plane for each building's floor, and then create a new light for another building and instance that. This essentially gives us full control over the colour temperature and light output per building. Randomise the placement of the planes to create some variation within the building. For example, skip floors or direct the light out of individual windows to really bring some dynamism to the piece. This is where lighting in your scene can really come into its own I.

10 Light the tower Use VRayLight Planes again to light the tower and place the lighting throughout the structure going from the inside to the outside. We want to light it partially as an architectural object and partially as an occupied space. Cool the lighting in parts; for example with the Parthenon-style building, use a Color Temperature of 5,200. For the interior lighting you should use something closer to 2,700 J.



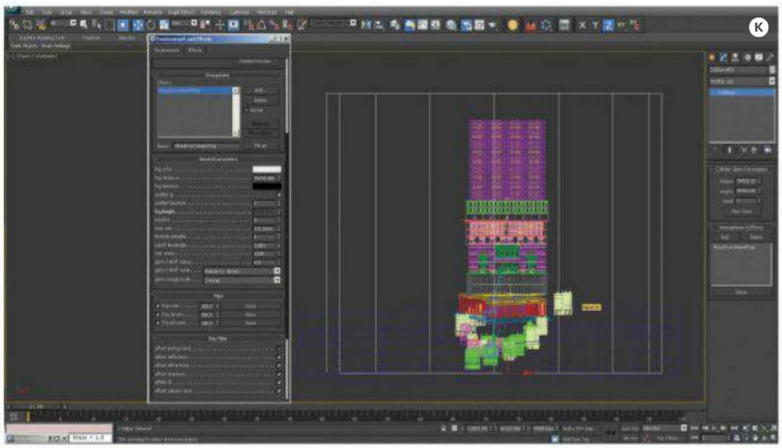
H The settings used for the low-resolution test render

I Some examples of the light placement for the buildings

J Placing lighting within the overall structure, using colour temperature for effect

Render your architecture

Set the scene and add some atmosphere for the final renders

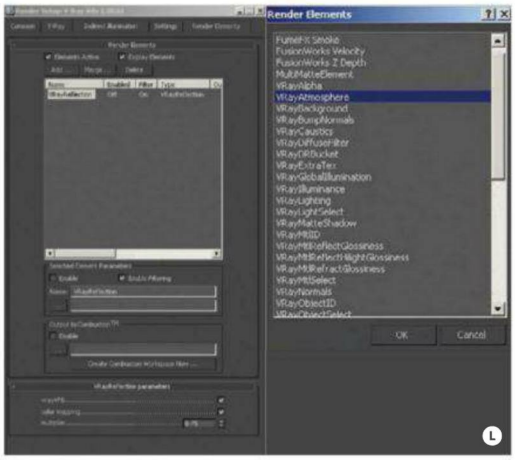


11 Add some V-Ray fog for atmosphere

First you need to create the gizmo that will contain the fog effects in your scene. To do this go to Create>Helpers> Atmospherics where you will find your gizmo. You have a choice between a cylinder or a box gizmo, but try to keep this as close to the edge of your scene as possible. Under the Environment tab in the Atmosphere window, add the VRayEnvironmentFog element. Here you can set the Density and Color of the fog as well as pick your scene gizmo and lights that affect it K.

To post or not to post?

The idea and application of post is worthy of an article of its own, but I will just touch on some of the positive aspects I consider. Sometimes things can be accomplished quicker in Photoshop than the render engine, so take full advantage of that. I also like the potential that can be realised when working in post-production, by adding effects or colour tones. Post can turn a render into a photoreal work or create an illustration. I don't always think post is good and things can be overdone, but often the raw render is just the start.



12 Use V-Ray render elements

Render elements are invaluable when it comes to post work. Crucially, whether it be in separating out your lighting, creating materials or object masks for final renders, this can save you a lot of time in post-production. Ideally we want some control over the atmosphere, so select the V-Ray atmosphere as well as the Object ID, Reflection and the Z-Depth maps L.

K The cylinder gizmo helper in the scene and fog settings

L Some of the options V-Ray gives you that you can be added to your final render

M The settings used for the final render

13 Apply the final render settings

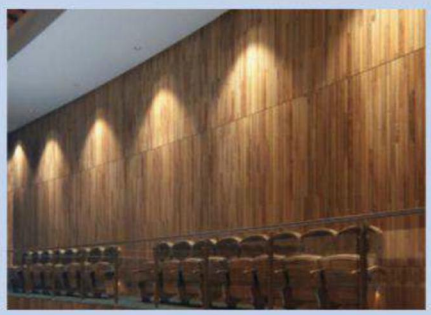
Set the final frame size to 6,000 x 5,000 pixels. This can cause render crash issues in computers with lower amounts of RAM, especially when this is coupled with render elements and high render settings. There are a few things that you can do to save your RAM. V-Ray will let you render to an image with a small preview that reduces RAM usage. You can also dump your stored RAM with a script, or close your file and re-open it. Another trick is to X-Ref your entire scene into another one M.

Artist Showcase

Chris Kowal

Based in Vancouver, Canada, Chris works as a digital illustrator, model-maker, 3D instructor and fine artist. He sees 3D primarily as a tool to explore in his professional life, classroom teachings and studio practice. He specialises in designing architecture and often incorporates themes of romanticism and nostalgia into his works.

Bar **3ds Max, V-Ray, Photoshop (2012)**
Chris wanted to do a partial study of an interior; this one was intended to have a heavy post-production feel



Theater **3ds Max, V-Ray, Photoshop (2012)**
This is a study Chris worked on for a project that he was involved with earlier on in the year

Post-production for arch vis

Create the final composition using Photoshop

7 hours creation time
Resolution: 6,000 x 5,160

14 Save out render elements Saving out individual render elements is easy with the V-Ray Frame Buffer. There is a Multiple Save button on top of the Frame Buffer that saves out all elements in the buffer at once. Then in Photoshop each individual file can be opened and combined to enhance the image. Save out the Object ID, Z-Depth, Reflection and atmosphere. Also render out an RGB version without any atmosphere N.

15 Create a background Start with three different sky bitmaps. We want to create a dusk effect but also a heavy atmosphere, so we need to combine them. Because of the time of day we also need to shift the skies to a darker range by layering them, adjusting the levels and multiplying subsequent layers O.

Painting fog and smoke

I used a couple of different methods and techniques when it came to painting in the atmosphere and smoke in the final composition. The first part is to have two versions rendered: one with atmosphere and one without. I then lay the atmosphere render on top of the one without and use a mask. This way I have some flexibility in the amount of atmosphere I paint out. Once I block the main areas out, I create another layer and paint some of the extra highlights and smoke detail on top. I use standard Photoshop brushes for all of this, with adjustments to the opacity and spacing.

16 Develop the post-production work This is where we take the image further into the post stage. Paint clouds and steam into the environment, add reflection layers and blend in your atmosphere render element. We'll focus on making the clouds visible over the lighting, essentially backlighting the smoke and atmosphere. This is also when you can add levels of light to areas and shift their colours P.

17 Final colour grading To finish we'll take the overall appearance of the image and create some vignetting. We'll also adjust the Curves, bringing back some of the image's contrast. You can also add a final colour grade and adjust the saturation level to get the overall look and feel you want. It works best if you stay within the colour range you started with. Just look to enhance things, not change them completely Q.

N The RAW render elements

O We want the foundation of the image to be relatively flat

P Paint in the smoke and atmosphere on layers

Q All final layers blended together

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3DArtist

Back to basics

Put the principles of animation into a pot, add milk and stir to create a walk cycle

With the Disc

- Maya scene files
- Video reference
- Image reference
- Final animation render

Maya

Learn to animate a walk cycle

Jahirul Amin guides us through the creation of a walk cycle in Maya, although the principles apply to other software, too

This issue, we're going to create a walk cycle. We'll be using the principles of animation that we looked at in last issue's bouncing ball animation exercise, and take them a few steps further – no pun intended. Once again, we're going to be using Maya, but obviously feel free to use whichever software package suits you best.

Last month we met the Graph Editor and in this exercise it'll be our main tool. We also used motion trails and they'll be used here to check for arcs and figure of eights at different points of the body. We'll be focusing on timing, spacing, weight shift, drag and overlap. All the principles of animation identified by the Disney masters in the 30s will be in action here, which is why the walk cycle is such a valuable exercise to learn well.

The creation of a walk cycle may seem relatively simple but it's deceptively tricky. We have many of the same issues that we faced with the bouncing ball here too, but now we have to contend with limbs, a head and a neck. How all these parts work together as a single unit is of huge importance. Moreover, I suppose because we are used to seeing people walk every day, a clunky walk cycle sticks out like a sore thumb.

So in order to get it right, as ever, the first step is to gather good reference. Watch

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people walk; watch kids toddle, the elderly hobble; watch skinny legs stride and watch stout legs waddle. Walk around the house yourself. Work out how many frames are needed to take a step. Get a feeling for which parts of the body are leading and which are following (for instance, the arms will follow the movement of the torso). Gauge how and when weight is transferred from one leg to another. Look for the subtle details such as the slight bob of the head, as these small points add such depth to the finished piece.

For this exercise we have kindly been given permission to use reference material from Endless Reference (www.endlessreference.com), which is a treasure trove of reference for animators to work from. As with the bouncing ball exercise, we've taken the footage into Kinovea (www.kinovea.org) to break down and analyse. You'll find a stack of videos and images that have been supplied with this issue of 3D Artist.

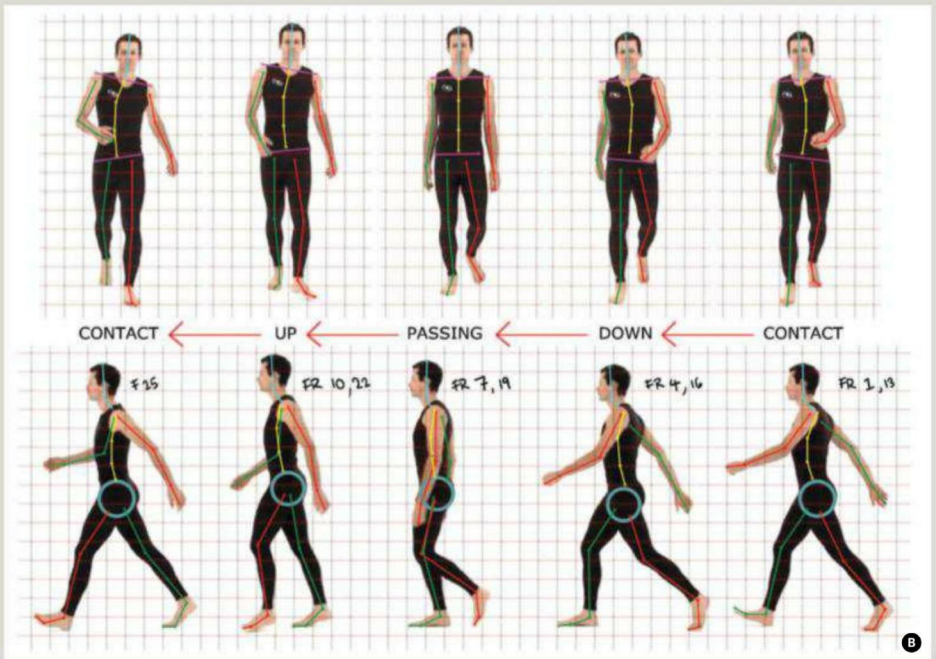
When you're studying the references, look for key poses that can then act as a guide for your walk cycle. However, please bear in mind that these poses should be a guide only and by no means should they be set in stone. Reference cannot be followed 100 per cent, as the camera is only a representation of the real world. You may find that the poses will need to be pushed further in order to produce a walk that actually looks natural or that is aesthetically pleasing. As an animator, you have to go in there, make your selections and feel what's real behind the reference. Use your instincts and experience to set the poses.

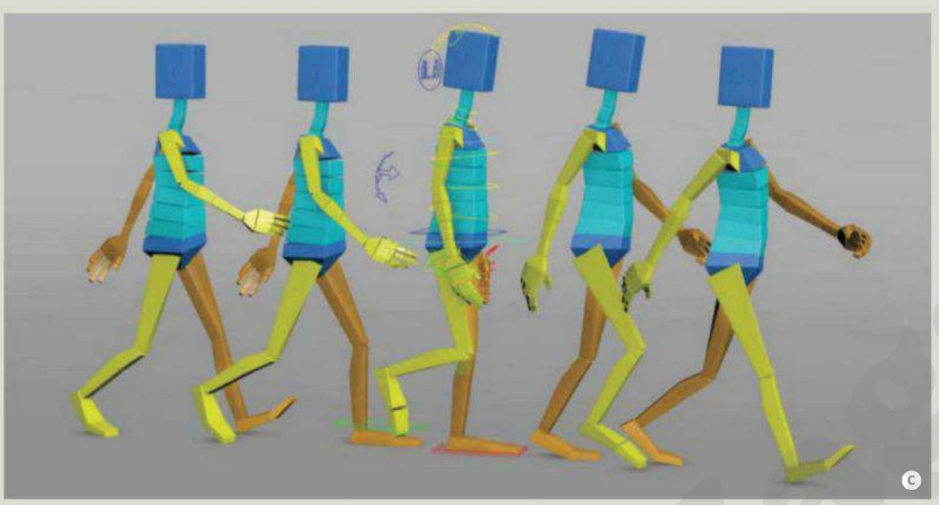
Moving on to the process more directly, so as to simplify working from reference, we've taken a few images from Kinovea into Maya and used them as a backplate. In doing so, there is no need to switch back and forth between two different applications, which makes life easier.

We'll be using pose-to-pose animation, although if you prefer to go straight into Spline mode then do whatever suits you. It's really important to make your work as organic as possible in order to keep things interesting. Either way, we'll be working to ensure that each pose is clearly readable. Additionally, we'll want to bring contrast and change to every pose, because if poses are held the result can be a jarring staccato effect. Think about what's leading and what's following – the poses should be set working from the root outwards, as whatever you alter in the root will affect the rest of the body.

Once your poses are in place, you can move on to splining the keys and going through the refining process. Again, refining will have to be from the root outwards. Please don't leave the computer to decide how it's going to transition from pose to pose, as the result will be poppy and lack weight. You're going to have to go in there and manually refine each curve. There may be times when you need to work frame by frame to get your curves moving well. For example, we'll be using IK for the legs to keep them planted on the floor, but the disadvantage of IK is that it works in a linear fashion from A to B, so no arc is created. As a result, there's no choice but to go in frame by frame and create some arcs. Fear not, though, the arms will be easier: we'll use forward kinematics, which uses rotation, to create some natural arcs. As you refine, don't be too precious about making changes; sometimes you can delete whole sections and re-work them to produce some delectably clean arcs.

Before beginning the animation, be sure to check your Animation Preferences. Again, we will be working in PAL (25fps) and as we're operating pose to pose we'll also set the Default Out tangents to Stepped. You will find this setting under the Tangents tab in the Animation category. This will hold each pose until we hit the next key without any interpolation between. Throughout the process make sure the arms are in FK mode and the legs are in IK mode. For this walk cycle every step will take 12 frames, making the full loop 24 frames. For this tutorial we're using BoxBoy, rather than an enveloped mesh, to enable us to see more easily how each body part moves independently.



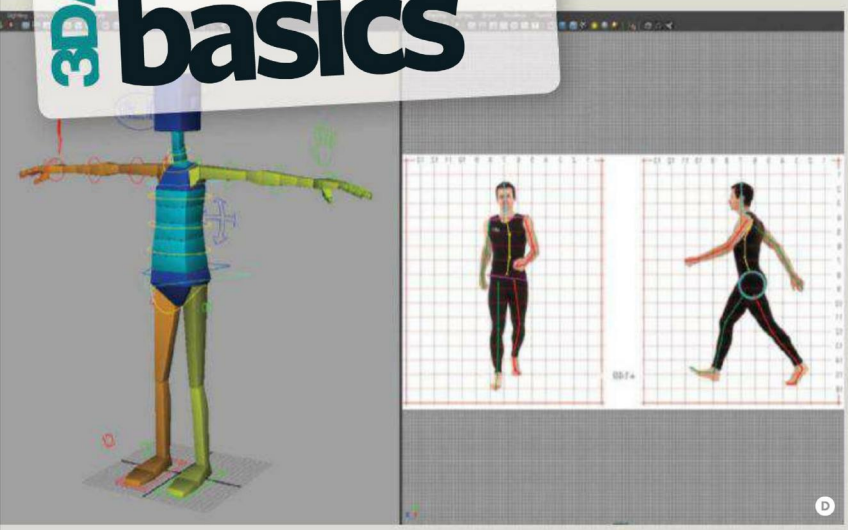


A A final render of the contact pose from three different views

B Analysing your reference is the essential first step

C A screengrab of all the key poses created for the final animation

3DArtist Back to basics



Walk this way...

01 Bring in the reference

Open up the supplied scene file: '00_boxBoyRig.ma' and let's begin by bringing in our reference. Go to the Panel bar on the Viewport and create a new camera by going to Panels>Orthographic>New>Side. In the new camera's Panel bar go to View>Image Plane>Import Image and select frame1.jpg from the Source Images folder. Next go to the Attribute Editor for the camera and scroll to the imagePlane1 tab. For Display, check Looking Through Camera. Go down to Image Plane and check Attached To Camera and then turn on Use Image Sequence. Translate the camera out of the way from the main action and split your layout into two panes side by side, enabling you to work with your reference D.

02 Contact pose

For the contact pose ensure the hips are evenly spaced between the legs. To translate the hips use the root_ctrl and to rotate them use just the hip_ik_ctrl. For the front leg use the Roll attribute on the leg_ik_ctrl to roll the front foot onto its heel. Use the same attribute on the back leg to rotate the foot onto its ball. Slightly rotate both feet outwards so they don't end up doing the march of the penguins, and add rotation to the hips to favour the forward leg. Work your way up the spine to get the angle of the shoulders contrasting with the hips. Add the swing of the arms to oppose the legs and indicate the effects of drag and overlap in the hands. Create this pose at frame 1 and 25 and create its opposite at frame 13 E.

03 Use a passing pose

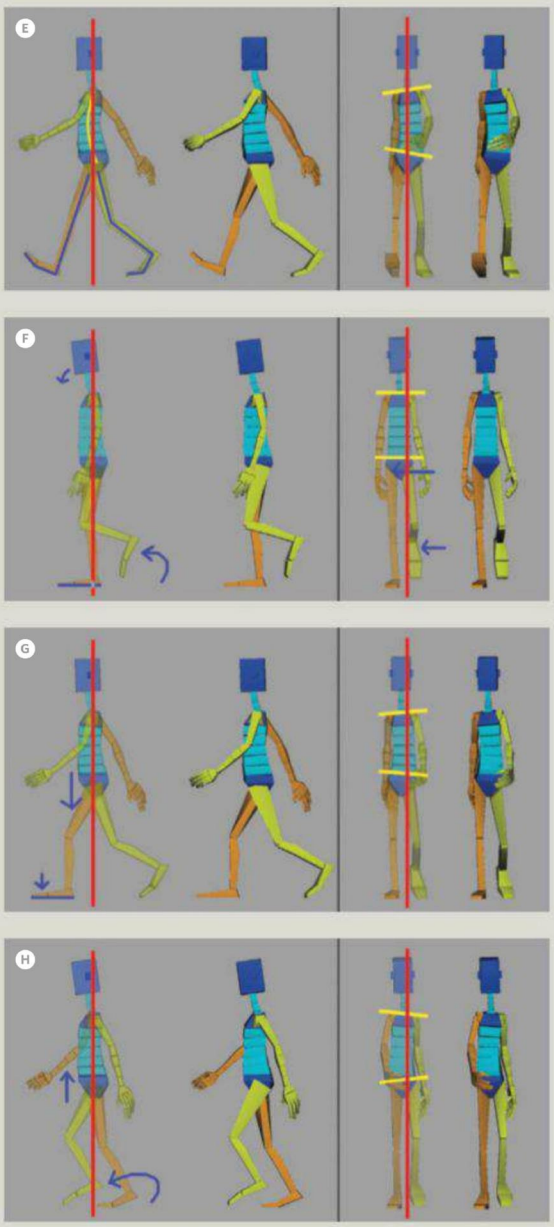
Now move to frame 7 to create the first passing pose. The front leg should now be directly beneath the body, straightened up, and the body's weight should shift onto the side of this supporting leg as well as slightly moving up. Have the back leg coming through and add some drag in the toes, using the Toe Wiggle attribute on the foot control. Straighten up the spine as well as the hips and shoulder. This will give a nice contrast going from the C-shaped spine in the contact poses to the straight spine in these passing poses. Next rotate the arms down to the side, working from the shoulder down to the hands. Once happy, create the mirrored pose at frame 19 F.

04 Add a down pose

Go to frame 4 for the down position. Have the hips go down as the weight is taken onto the leg and make sure the forward foot is flat on the floor. Use the Roll attribute on the back foot to bring it onto its toe ready to come off the ground. Add more drag to the hands as they try to catch up with the rest of the arm. Use the reference images as a guide but push this further if you wish to do a more exaggerated walk. Again, we need to mirror the pose at frame 16 G.

05 Move to an up pose

Step to frame 10, translate the root slightly up and add some roll to the back foot. Don't push the root up too much here as it can look forced and unnatural. We don't lift too much off the ground but again this will be down to your personal taste. Add some rotation to the hips to favour the forward-moving leg and do the opposite in the shoulders to get that contrast. Add some drag to the toes of the forward-moving foot, then create its opposite pose at frame 22. Make sure we only have 24 frames on the timeline now as frames 1 and 25 should be identical. We don't want to view the same frame twice as we play back H.



Playblast away!

Playing back your animation in the Viewport is never the best way to check for timing. Depending on how heavy the scene is, it may play too slow or too fast. A Playblast will create a quick video of your animation, enabling you to view it at the correct speed. Throughout the animation process, from blocking to the final polishing pass, it's vital that you Playblast your animation often. To do so, hold the right mouse button over the timeline and click on Playblast. You can also bring up the Frame Count to give you an indication of the Viewport playback speed. To do so, go to Display>Heads Up Display>Frame Count.

D Taking reference directly into Maya can be more efficient than not

E An illustration highlighting the areas of focus

F Notice the weight shifting to the supporting leg

G The weight comes down as the foot catches the body

H The back leg moves forward, ready to get into the contact pose

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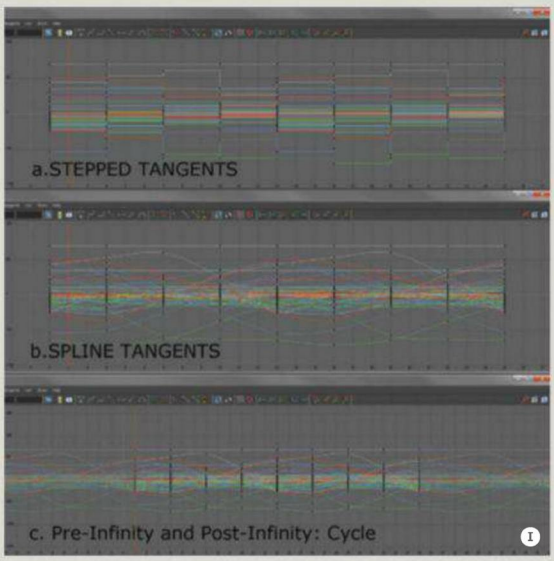
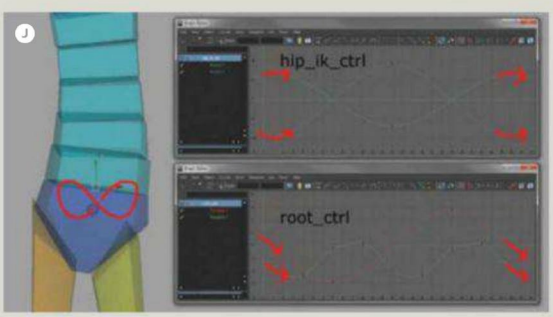




06 Step on to spline

Select all the control curves in the Viewport and open up the Graph Editor. Go to View and turn on Infinity. Select all the curves in the Graph Editor and go to Tangents>Spline. With the curves still selected, go to Curves>Pre Infinity>Cycle and Curves>Post Infinity>Cycle. If you hit Play now, your animation may look pretty floaty and also have quite a bit of popping happening. If you look at the tangents of your curves as they come in and go out at frames 1 and 25, you'll notice that they can be pretty sharp in places. This will all need to be smoothed out by editing the tangent handles to enable the loop to work smoothly. You can also go through and delete any curves that have no influence whatsoever. These will be the curves that are totally straight I.

07 Refine from the root

Go to Window>Settings/Preferences> Preferences and highlight Animation in the left column. Go to the Tangents tab and change the Default Out tangents to either Spline or Auto. Whenever we add a new key now we will get the interpolation in the curves. Now we start refining and again we'll start at the core and work our way out. Use your Graph Editor as much as possible from now on and massage each curve. We want to end up with hips that create a figure of eight as the body's weight shifts from one leg to the other. At this stage you should use motion curves as much as possible. Select the hip_ik_ctrl, go to Animate>Create Editable Motion Trail and use it as an accurate guide to create transition from one leg to the other J.

08 Move down to the legs

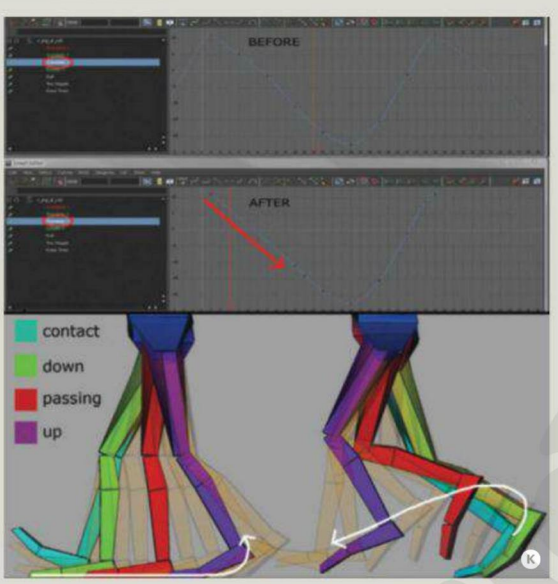
Currently for the legs it takes four frames to have the foot completely flat. To add more impact and weight, take the Roll attribute to 0, two frames after the contact pose. Also add some delay in the toes to slap down around a frame later. While the foot is flat on the floor, it's also important to make sure it translates back at a constant speed. This is to help reduce the slipping and sliding of the foot should we end up moving this character through space as opposed to on the spot. Again, use motion trails to create decent arcs and if you have to, go in and animate frame by frame to do so. The legs can be the trickiest part to get right. Make sure you spend time here to iron out any severe popping and get the co-ordination between the hips and the legs right K.

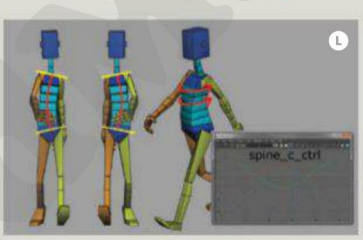
09 Work up the spine

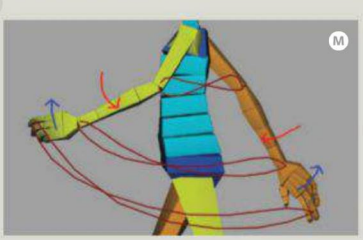
Getting the spine to work well shouldn't take too long. We mainly want to focus on getting the movement clean without any jerkiness. Take out the majority of the key frames that are not adding too much and really smooth out the curves. Also add some twist to oppose the hips and gradually increase the amount of twist to propagate up the spine. Moving to the neck and head, add delay to these parts so they feel as if they are always playing catch up. An easy way to do this is to take the keys for the neck and head and shift them back two frames. Select the keys for the head and shift them back a further two frames L.

10 Adjust arms and hands

Start the refining process from the shoulder and work your way to the hands. Select the controls and create the motion trails to help you make those arcs that naturally occur as we rotate our joints. Add some subtle movement to the fingers so they don't feel rigid. Shift keys back to add delay to the lower arm and the palm. This makes the walk more fluid and less mechanical. From this point it's a case of going through again with a final level of polish. Check each curve for every control and ensure the transition in and out is smooth. This will reduce any popping as the cycle loops. Finally, the basic backbone of a generic walk should be there – so try giving it some personality M.







Getting personal

By the end of the tutorial you should have a fairly generic vanilla walk. From here, you can start adding in some personality, because as Samuel L. Jackson would say: "Personality goes a long way." See what happens if you bring the feet up higher on the up pose. Does it make the character feel angrier? What happens if you reduce the swing on the arms and rotate the head lower? Does he seem depressed? Go ahead: experiment a little and make your walk a 'Royale with Cheese'!

I Cleaning and refining the curves will give us much smoother results

J Focus on getting the arcs and figures of eight

K From the contact to the roll off the ground, try to make the speed constant

L Try to get the shoulder to oppose the hips to give you plenty of contrast

M Capture the natural arcs that occur in the human body

3DArtist

Masterclass

3D expert Ross Board demonstrates some of the destruction techniques available to 3ds Max users with the awesome RayFire plug-in

With the Disc

- iMac model, courtesy of The Pixel Lab
- Blackberry model from Premium3Dmodels.com
- iPhone 5 model, courtesy of Video Copilot

Achieve maximum 3D destruction with RayFire

"Using the models supplied, we'll learn how to smash several popular screens for realistic damage"

Destruction effects within 3ds Max have always been a hotly debated subject, with many a book written exclusively focusing on each in-depth technique. In this tutorial we will be examining some of these tried-and-tested methods to demonstrate how easy it is to digitally destroy glass using RayFire with 3ds Max.

The cracking element of this tutorial will focus on the creation of a static image and as such we will demonstrate the steps required in post-production to improve the overall finish.

In the complete screen-destruction simulation you can expect to learn the core techniques involved in professional digital demolition effects. This is a vast move away from simply mapping 2D images of crack textures onto a screen.

RayFire, by Mir Vadim (www.rayfirestudios.com), is a bombproof tool designed to grant users the ability to fracture, smash and ultimately wreak havoc on geometry in all manner of interesting ways. A free (Max 2011/2013-compatible) trial is available from Mir's website and will be needed in order to follow along with this Masterclass tutorial.

In short, RayFire functions by fragmenting selected geometry in a number of different ways, depending on the required action or impact. It then passes the remaining task over to the NVIDIA PhysX plug-in (which is required as a separate download) to deal with the destruction that inevitably ensues.

There are a number of free and alternative ways this task can be approached, including the free Fracture Voronoi script (www.scriptspot.com/3ds-max/scripts/fracture-voronoi) in conjunction with MassFX. However, these options don't deliver the same believable results to the extent of RayFire, which has been lauded as a key tool in the professional VFX industry for some years now.

To follow this tutorial, there are a number of prerequisites users must take into account. It's advisable to have the same components installed, including 3ds Max 2011 to 2013 (x64 or x86) and the PhysX

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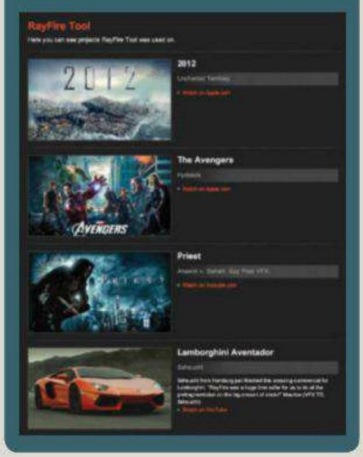
B RayFire 1.59's destructive effects occur by way of a modifier, which is perfect for still images

A brief history of the RayFire plug-in

RayFire was born as a result of creator Mir Vadim's frustration at a lack of commercially-available destruction tools for CG professionals. It has been on the market for some years now and has gone from strength to strength, with licences in use at some of the world's most powerful VFX and advertising houses. RayFire can be seen in action in popular blockbusters such as *Marvel's The Avengers*, *Transformers* and *2012* to name a few.



A RayFire is a proven plug-in for 3ds Max, supporting all manner of chaotic effects

plug-in for 3ds Max (found via www.physxinfo.com; we are using version 2.85 successfully). The RayFire plug-in for 3ds Max (available from www.rayfirestudios.com; we are using version 1.59) is of course also essential.

All lighting and rendering techniques demonstrated will be achieved using the V-Ray rendering engine. However, this is absolutely a matter of personal preference; please experiment throughout and see what results can be achieved using alternative methods. All of this tutorial is designed as a framework to build on and can be transferred to seemingly infinite alternative scenarios.

It's important to understand the steps behind what is occurring in the final sequence so as to fully grasp the visual results you generate by way of each simulation. Why have the fractures appeared in that formation? What is driving the tennis ball to make impact and subsequently interact? Here we briefly run through the two processes:

Fragmentation

RayFire uses several fragmentation algorithms; each one slices and divides geometry in different ways and can be altered parametrically. The core (and most frequently used) fragmentation modes to consider are driven by three different division engines, namely ProBoolean/ProCutter, Voronoi and Brick division.

Each division engine contains a number of sub-parameters offering means by which to fragment geometry uniformly, irregularly. It can fragment with reference to an impact point, a mouse cursor or a pivot point.

For this tutorial we will be using the slightly more advanced Voronoi division engine. This has the ability to fragment based on a radial collision in a way consistent with what you would expect of impacted glass: dense fragmentation at the point of impact spiralling out to larger and less-damaged areas.

Physics

Upon completion of the fragmentation phase we'll begin defining the physical properties and interaction states of each object within the scene. RayFire will simulate each as either Dynamic, Static, Kinematic or Sleeping objects. It's with this that you need to understand how the desired interaction should take place. In the case of the tennis ball impacting the monitor we require the glass to break upon impact. We want to avoid it breaking under its own weight (or from lack of rigidity as it is now several hundred objects) at the start of the simulation. In order to achieve this, the glass' definition is changed from a Dynamic to a Sleeping object, which only becomes Dynamic when impacted by another Dynamic object (the ball).

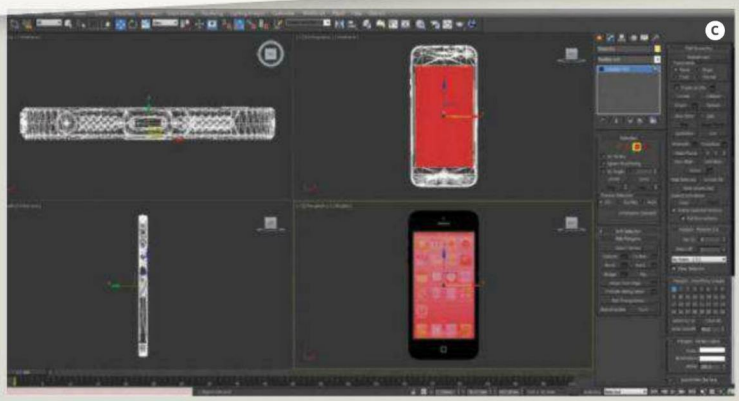
The scene setup is as follows:

- **Glass fragments:** fragmented as a Dynamic object then moved into the Sleeping object category.
- **Tennis ball:** inserted as a Dynamic object after all fragmentation is done.
- **Monitor bezel/stand and floor plate:** defined as Static objects that influence simulation, yet never move.

To give the tennis ball the forward motion required to impact the screen, it's manually keyframed to head towards the desired impact point with one frame or so margin before impact. It's at this point we instruct RayFire to begin the simulation.

The simulation runs as follows: at frames 000 to 004 the manually keyframed ball moves towards the screen. At frame 005 the RayFire simulation begins, taking inherited forward motion into account.

NVIDIA's PhysX takes control of the operation following this stage, drawing from the definitions established within RayFire and the various material properties and applying standard forces such as gravity to the equation. It then continues to animate and bake keyframes to the timeline.



C Always import and separate the geometry according to the intended use. Add a glass box as a screen

D Adjust the point of origin and apply the RayFire Fragmentation modifier. Ensure the Radial mode is checked

E Apply the RayFire Cracks modifier and tweak visible cracks, then add new material IDs

F Some additional work in Photoshop can often add a great deal of realism to your still images

G Import and clean up the new OBJ and assign glass to RayFire's Dynamic/Impact Objects list

From cracking to smashing: an overview of the demolition process

01 Prepare the geometry

The supplied models include an OBJ of both an iPhone and Blackberry. Initially we will be using the iPhone model. Import this into a new 3ds Max scene and, using the Edit Poly functions, detach the screen, which should be set as Material ID: 2. Next, push this geometry back into the phone slightly and replicate to form the glass that acts as an overlay. Assign a glass material and bear in mind any odd geometry may cause problems, as this is the piece we will be destroying C.

02 Apply the RayFire Fragmentation modifier

With the glass geometry selected, apply the RayFire Fragmentation modifier. This will spawn a series of options enabling fragmentation of the geometry in the ways discussed previously. Select Radial and ensure you are using the Voronoi fragmentation engine. Press Fragment and you should see cracks appear before your eyes. If this is not the case, check the axis positioning and rotation as this forms the basis of the process. Tweak the Radial settings until the fragmentation is fit for purpose and ensure a value is placed in the Crack Width box (suggest 0.5mm). Please be aware that high values for other settings can be very CPU- and RAM-intensive D.

03 Use RayFire Cracks

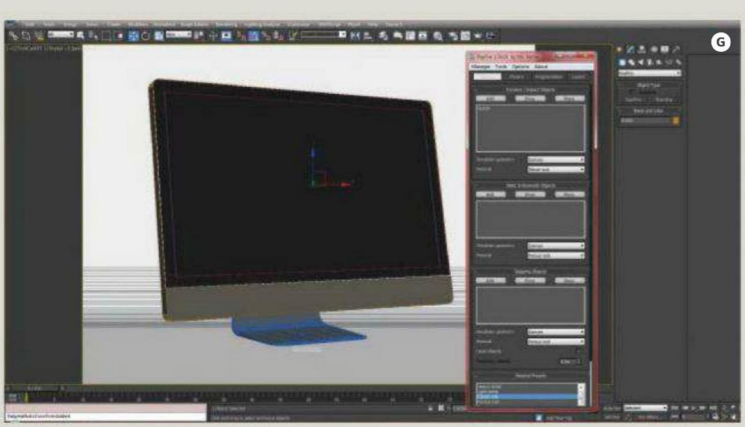
To further refine the fragmentation we have created, apply a RayFire Cracks modifier to the top of the stack and tweak the settings to match those illustrated. This enables users to select which cracks are visible (and also animate them emanating from the origin). In our case we will be using this as a means to filter the Angle to Centre parameter, ensuring that mostly long cracks are prominent and losing some of the smaller connecting ones. Subsequently apply an Edit Poly modifier and assign a new Material ID: 2 to the internal faces. To finish, we'll assign a frosted white material to get a realistic break E.

04 Light, render and move to post-production

Once you're satisfied that the fragmentation and cracking is sufficient, place the model in a simple studio scene and render it. If you are using V-Ray, be sure to render passes, taking care to include Reflection and Wire Color options. Open the resulting files in Photoshop (or similar) and use masks and adjustment layers to achieve the best possible look. In order to further accentuate the broken glass and add realism we have screened an image of a broken window onto each of the handsets F.

05 Begin to animate

Open up a new scene and import the iMac monitor OBJ file supplied. Edit it as per the iPhone scenario to have a single piece of glass geometry to smash – the cleaner the better. Open RayFire from the Create menu and assign the glass screen geometry to the Dynamic/Impact Objects group. This will ready it for fragmentation within RayFire G.



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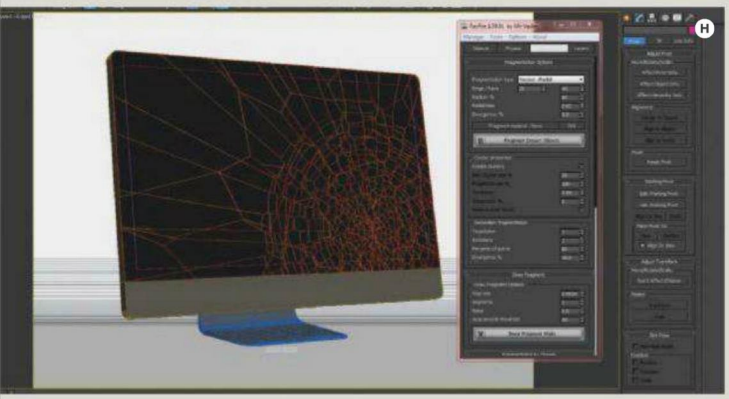
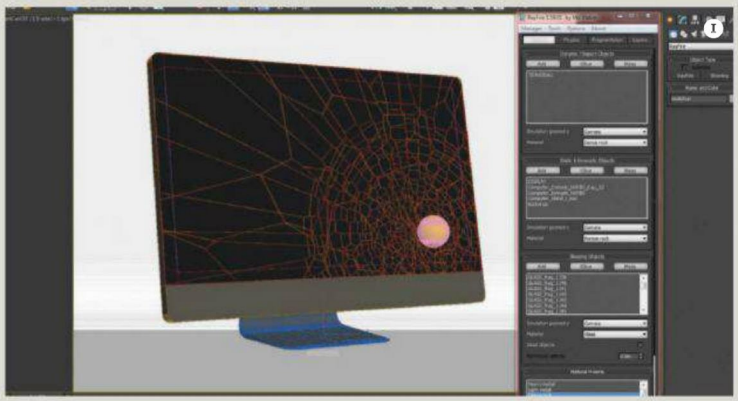




06 Glass fragmentation

Open the Fragmentation tab within RayFire and select Voronoi - Radial as the Fragmentation. This will work the same way as with the iPhone scenario, so ensure the pivot point is positioned accordingly for fragmentation. Select a reasonable number of Rings / Rays (20 or 40 should be okay) and turn on Secondary Fragmentation. Press Fragment Impact Objects and RayFire should once again work its magic. Should you wish to reset the result, click Manager and select Delete. This will remove the top level of fragmentation H.

07 Assign Dynamic simulation types

Return to the Objects tab where it's now necessary to assign a new Sleeping status to all of the newly-created glass objects, ensuring they don't react until influenced by a Dynamic object. Once this is complete, add a sphere to the Dynamic/Impact Objects list as your Impact object. Finally, add any surrounding objects – such as the monitor frame and floor plate – as Static and Kinematic Objects. This is to ensure the fragments don't intersect or simply pass through them during simulation I.

08 Keyframe the impact animation of your objects

Now we must add some velocity to the tennis ball object to ensure any impact is worthwhile. This will be done by simply keyframing the tennis ball off-screen at frame 000 and having it fractionally away from the desired impact point at frame 003. RayFire will then be directed to take control at frame 004 and will inherit and address the ball's previous motion J.

09 Direct the simulation

Within the Physics tab, ensure that PhysX is selected as the physical simulation engine and inform RayFire that it should start at frame 004 and continue the simulation up to frame 30. This can obviously be longer, however we are only requiring a suitable still image at this stage. For slow-motion effects, tweak the Time Scale value K.

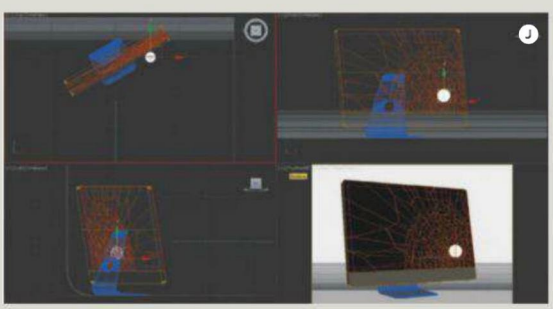
10 Crash, bang, wallop!

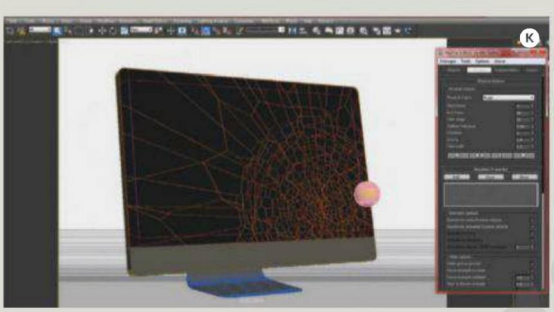
Press the Play and Record button and RayFire will begin to action all of the commands so far, creating a PhysX-based world to smash the glass fragments upon impact. Within one minute, depending on CPU speed, the results should appear before your very eyes and will be baked to keyframes. PhysX is notoriously fast, so even the most complex of situations shouldn't take too long L.

Enhance your effects

Using RayFire on its own can yield great results, but we also recommend trying RayFire out in conjunction with several other 3ds Max plug-ins and technologies as well, such as the particle system as a start.

One to investigate in particular is Sitni Sati's outstanding FumeFX plug-in, which creates incredible smoke and fire effects – all of which can interact flawlessly with RayFire. Think building demolition and exploding cars!





H Using the Voronoi Radial modifier, add divisions to the glass geometry

I Change the Dynamic status of your scene objects and add an Impact object to begin the impact animation

J A keyframe animation giving the Impact object an initial motion is required before moving on to simulate in the PhysX plug-in

K Set up the Time and Physics Solver properties before you begin the simulation

L Press Play and Record and destruction should follow, baking to keyframes as the animation plays

3DArtist Questions & answers

Welcome to the Q&A section where we answer many technical quandaries in the most popular 3D programs, including Blender, CINEMA 4D, modo and ZBrush

Need help fast? Join the

The advisors

Blender
Filippo Veniero
www.ifilgood.it

Although Filippo has a degree in engineering, he's made graphics his career. He likes to emphasise simple objects, focusing on realistic results

modo
Richard Yot
www.itchy-animation.co.uk

Richard is an illustrator specialising in creating quirky characters and worlds. He enjoys giving CG work the charm of realistic hand-made things

ESTIMATED TIME TO COMPLETE THE TUTORIAL
1 HOUR PLUS BAKING TIME

With the Disc

- **fluid_test_3D_Artist.blend.zip**
This file contains the scene without the simulation; simply press the BAKE button to start the simulation
- **splash_hi_res_FINAL.jpg**
High-resolution render
- **strip.jpg**
Series of low-resolution frames
- **Plus tutorial screenshots**

Blender

Simulate a splash effect in Blender

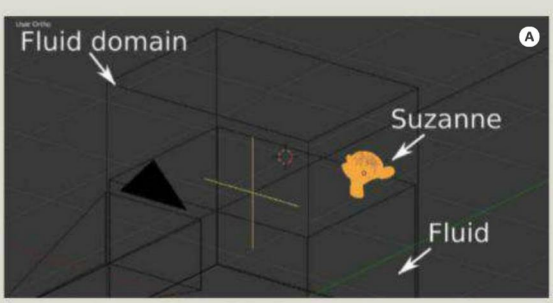
"How can I create an effective fluid simulation using open-source software?"

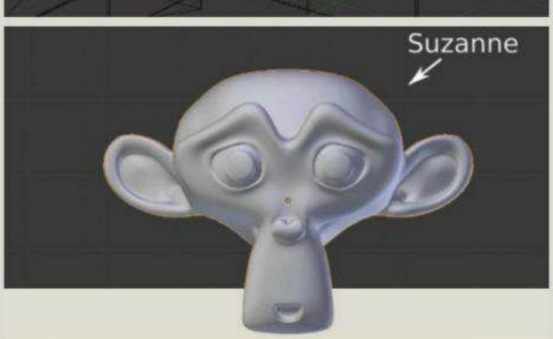
Summer is over, but with a good fluid simulator you can play with the water even when the weather is cold! In this tutorial we'll show you how to make a realistic splash with Blender in six simple steps.

Blender's fluid simulator was developed in 2005 and uses the Lattice-Boltzmann methods (LBM), which has several advantages over other conventional methods, especially when dealing with complex boundaries (more information is available on Wikipedia: http://tinyurl.com/3D48Blend). If after reading the Wiki page you're feeling a little scared of Taylor series expansion, or partial derivatives, please don't worry. Luckily, we don't actually need to study the physics of fluids to make good simulations in 3D software; we simply need to set a few parameters in Blender, and we're away!

We will use a Fluid Domain object (a cube mesh), a Fluid object (another mesh) and an object for the splash. The Fluid Domain object (or simulation domain) is 3D space where the simulation will take place. The most important options are: Resolution (determining the amount of details in the fluid), Viscosity (indicating the type of fluid you want to use) and Realworld-size (size of the domain object in the real world, in metres).

Inside the Fluid Domain menu we can insert a mesh that creates fluid (an Inflow object) and enables us to produce a liquid stream into the domain, or a mesh that removes fluid from the scene (an Outflow object), or simply an Obstacle object. More details about Blender's fluid simulation engine can be found at http://tinyurl.com/blendhelp and on the forums at http://blenderartists.org.





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CINEMA 4D
Adam Benton
www.kromekat.com

Adam is a freelance illustrator and designer based in the UK. His clients include such names as Saatchi & Saatchi, Coca-Cola, Intel and MGM

ZBrush
Paul Gaboury
www.pixologic.com

Paul is the lead 3D application engineer for Pixologic. He helps clients incorporate ZBrush into their pipeline and is a member of the development team

Send us all of your 3D problems and we'll get them sorted. There are four methods to get in touch with our team of expert advisors...

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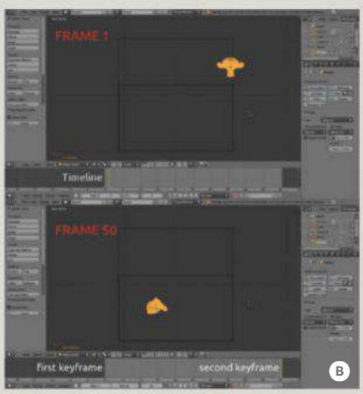
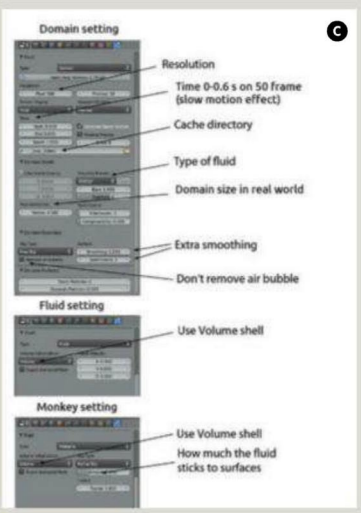


01 Scene setup

Let's begin by setting the scene. We will use a cube (Add>Mesh>Cube) of around two Blender units as a Fluid Domain object, a smaller box inside as a Fluid object and Suzanne (go to Add>Mesh>Monkey) as an Obstacle object. Make sure that all the fluid is contained in the domain, so the Fluid objects outside the domain will not bake. Set the camera so it focuses the scene from the front view A.

02 Set up the animation

In this step we'll create the movement of Suzanne. Set the monkey in the upper-right corner of the image, go to frame 1 (the Timeline is below), insert a keyframe (hit I and select LocRot) and then go to frame 50. Move and rotate Suzanne in the mesh that will be the liquid and insert another keyframe (again hit I and select LocRot). This way we have created a small animation that moves Suzanne with a certain velocity and rotation within the fluid B.

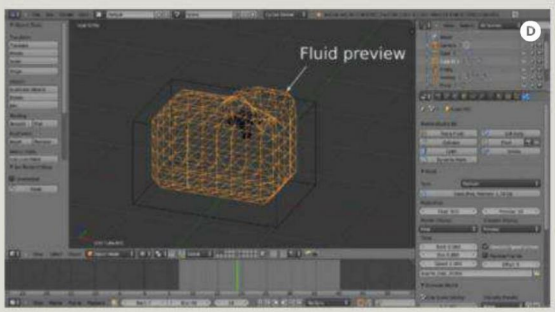


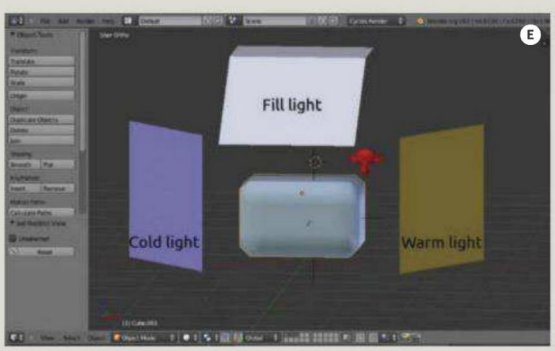
03 Manipulate the fluid

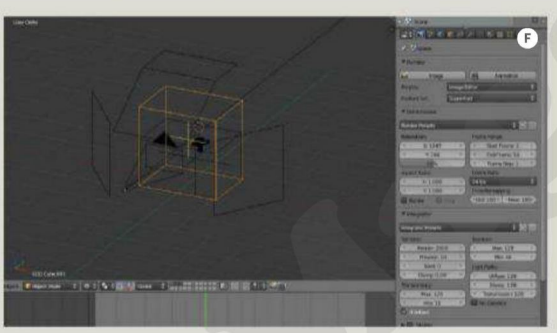
Let's set the parameters of the simulation. Select the mesh inside the domain, click on Blender's Physics panel and select Fluid, setting Volume Initialization as Volume. Next, select Suzanne, set Fluid Type to Obstacle, Volume Initialization as Volume and Slip Type to Partial Slip (Amount: 0.2). To finish the step, select the Fluid Domain object and enable Physics for Fluid. Set Type as Domain, Resolution to 300, End Time to 0.6, Preset Viscosity as Water, Realworld-size to 0.5, Slip Type as Freeslip, Smoothing to 1.2, Subdivisions to 3, uncheck Remove air bubbles and set Particles Generated to 0.1. Now click on the Bake button C.

04 Bake the simulation

During bake time, Blender creates files of the simulation frame by frame. The baking process may take a lot of time depending on the resolution, subdivision level and the type of processor. What's very important is the amount of RAM. If the resolution is too high, and exceeds the available RAM, the computer may freeze. For this simulation we used a mid-range PC with Ubuntu, a dual-core processor, 4GB of RAM and the simulation was made during the night. After you've baked your fluid, you can run the animation (Opt/Alt+A) D.







05 Use lights and materials

We'll use three Emitter Planes as lights. One over the water (white light) and two Lateral (a cold light and a warm light). The different colours between warm and cold light improves the visibility of the water droplets at render time. The Liquid material is a Glass shader (Index of Refraction at 1.33); the Suzanne material is a Glossy shader mixed with a Red Diffuse shader E.

06 Rendering and post-production

Select one frame and increase the number of bounces in the settings of the integrator. If this number is too low, raylights can't pass through all the liquid surfaces, so the final image will have black areas in the water. Set the Render Pass number to 2,000 and launch the render. A medium-resolution image takes a few minutes. When the render has finished, use GIMP (www.gimp.org) to tweak F.

Simulation troubles

A simulation process can be a heavy load for the CPU, so before leaving your own computer frying for hours you should take some precautions, such as making sure that the heat sink is clean from dust. The RAM is another bottleneck as some operating systems restrict the memory usage of individual processes, meaning Blender may be closed unceremoniously. If you don't have a lot of RAM, it's better to close all programs that are not needed and try to use an operating system that uses as little RAM as possible.

ESTIMATED TIME TO COMPLETE THE TUTORIAL
1 HOUR

With the Disc
The 'soda_bottle.c4d' file should be used as a starting block to follow along with. The 'soda_bottle_final.c4d' file is provided as a final reference

"How can I create classic details used in beverage advertising images, like water droplets and fizz?"

CINEMA 4D

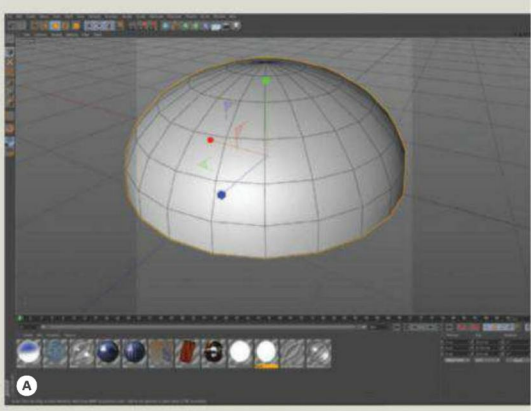
Condensed water tricks

We've all seen those eye-grabbing advertisements in magazines, on billboards and in other media, depicting a particular soft drink or alcoholic beverage that looks appealingly sparkling, thirst-quenching and generally just makes you want to rush out and buy one. In years gone by, these images would most likely have been created using studio photography, airbrush illustrations, or a combination of the two techniques to get the best look and an enhanced-reality aspect in the image. These days of course, like in most other fields of product advertising, it's often beneficial to create these products entirely in CG, which offers countless advantages and flexibilities.

In the past I've created models and scene setups for famous brands of drinks, which would be used in digital advertising. So, apart from making a good likeness of the product, the client obviously wants it to look slick, appealing and refreshing. Since we are dealing with either a glass or reflective/glossy product, in terms of the scene setup much of this is achieved through using appropriate reflection/refraction maps or HDRI and selective reflecting planes, along with actual lighting.

In the portrayal of the product itself – apart from accurate re-creation of the bottle's shape, features and details – the added details of water droplets on the surface of the bottle and small gas bubbles can help add a sense of realism. This will create that all-important refreshing look we are trying to achieve.

We will look at how to create and add water droplets to the surface of the supplied bottle mesh ('soda_bottle.c4d') using the MoGraph module's Cloner tool. The same technique can also be used to add fizzy bubbles to the liquids, and we'll also show how to make the water droplets and bottle really pop. Placing flat planes with a luminance material applied, as well as a suitable reflection material or HDRI and lights, can make the reflections and refractive qualities of your materials look more exciting. Finally, we'll use Photoshop to tweak the water droplets' shapes to add subtle variation and a degree of randomness using the Liquify filter.



01 Simple water droplets

In the example file supplied, go to the MoGraph menu and select the Cloner tool. Add a sphere and change its type from Standard to Hemisphere. This will be our water droplet. It's a little too spherical as it is, so it will need to be made editable and scaled down a little in the Y-axis. The mesh is a little low-poly as is, but the scene will respond quicker since there will be a few thousand of these A.

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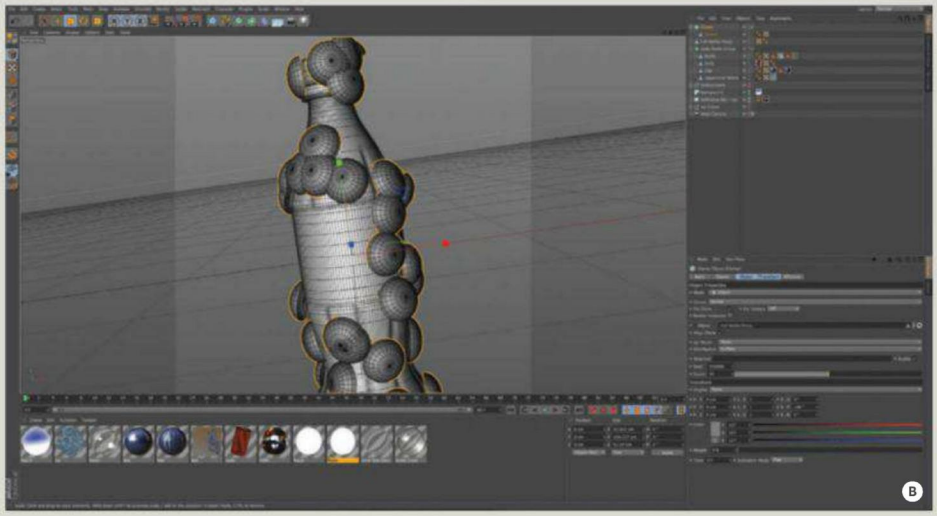
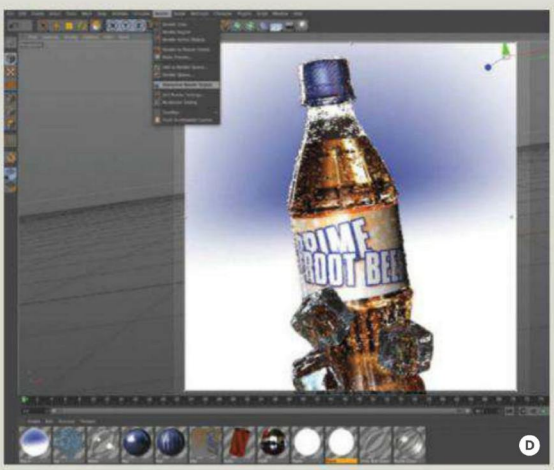


02 Use a proxy

Add the sphere mesh to the Cloner object and switch the Cloner Mode to Object. Now, by adding the prepared full bottle proxy mesh to the Object field, we have something to clone onto. Switch the Distribution to Surface and increase the Clone Count to 3,000. The droplet mesh is probably aligned to the inside of the bottle mesh. You can amend this in the Transform tab of the Cloner object by rotating the P (Pitch) to 90 degrees B.

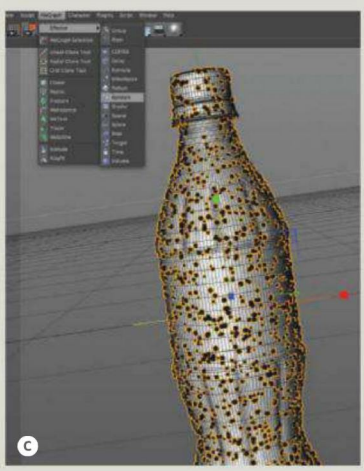
03 Randomisation and fizz

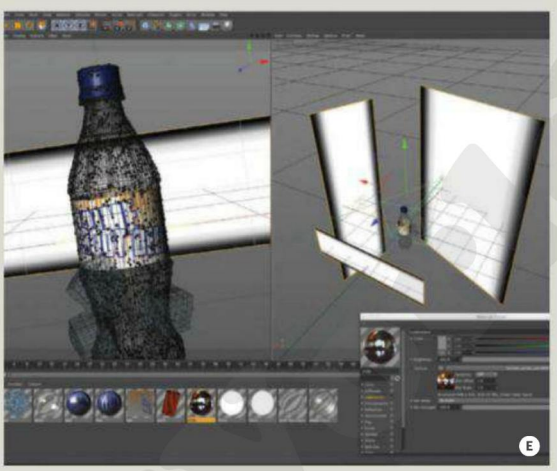
The droplet will need scaling down significantly to about 1.5 units and a suitable water material should be added. With the Cloner selected, add a Random Effector from the MoGraph menu. Uncheck the Position button in the Parameters tab, tick Scale and give a Uniform Scale of 0.5 units. The same process above can be repeated for fizzy bubbles in the soda mesh, but instead of Surface, the Distribution should be changed to Volume and random scale is not really necessary C.



04 Apply lights, planes & reflection maps

With limited space to explain every element used, it's best to explore those in this example. From the Render menu select Interactive Render Region and adjust its boundaries to show the entire bottle mesh. Open up the Environments Group and enable each element (Reflective Sky, the lights and the Reflective Planes) one at a time, both isolated and in tandem. See how they each affect the overall look of the bottle, the soda and the water droplets D.





Pre or post?

In some illustrations there are often pros and cons to doing more of the detail work in the 3D scene file itself first. In some instances a lot of time can be saved by leaving these elements to the post-production stage. For animated work it obviously makes more sense to have as much of that detail in the model itself, as tweaking some things on a frame-by-frame basis would be very tedious and inefficient. For still images, understanding whether to let the 3D software do the work at render time or whether to tweak in post is vital. Certainly, it can save you a lot of time and frustration.

05 Adjust the material

After exploring how each element affects the look of the model, look at the materials and textures that each of these uses. The planes have a gradient, creating a bright, soft-edged linear reflection/refraction in the bottle or liquid. Move these planes around the model to create tall highlights where you prefer them. Similarly, the HDRI choice – and how its Sky object is rotated – changes the strong rim lighting and highlights on the bottle and water drops E.

06 Move to post-production in Photoshop

When all tweaks are done and a decent resolution render is complete, it's worth doing some subtle post work. To add some randomness to the water drops, the Liquify filter is perfect – just a few pulls and pushes here and there on some key droplets is enough to create plenty of variation in shape, making them look more realistic and interesting. Finally, add some starburst-type brush effects to emphasise glints of light on the ice and bottle F.

Welcome to the Q&A section where we answer many technical quandaries in the most popular 3D programs, including Blender, CINEMA 4D, modo and ZBrush

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modo, NPR Kit, Photoshop

Create hand-drawn effects with 3D models

How can the new NPR Kit give a traditional look to renders?

Luxology has released a Non-Photorealistic Rendering kit for modo 601 that enables various hand-drawn or printed effects to be applied as shaders to geometry. There is a nice variety of different looks included and several distinctive effects can be achieved.

One benefit of using shaders rather than a post-process effect is that the NPR effects can be applied to only parts of a scene and mixed with other elements that are rendered using modo's standard render engine. This enables NPR effects to be mixed with photoreal elements within the same scene; however, NPR shaders can be applied globally by placing them at the top of modo's Shader Tree.

The most powerful of the included shaders is the SketchTone; this enables sampled hatching patterns to be applied, optionally conforming to a UV map. Crucially, it opens the door to a multitude of hand-drawn effects that will respond to the lighting in any scene. What makes this shader so powerful is that you can create your own SketchTone shaders, or even sample them from existing artwork. By enabling artists to create their own sketch shading there is a lot of scope for really creative and individual results, as well as a lot of control over the final look.

SketchTone shaders can easily be created using several techniques. For example, you can draw some hatching patterns by hand – with pen and ink for example – then scan them in to use in modo. Alternatively you can use brushes in Photoshop to create hatching patterns or even more painterly effects. You can even find some existing artwork that has interesting hatching effects (such as a woodcut or engraving) and sample hatching patterns from it.

Once your hatching patterns are scanned, drawn or sampled, you will need to ensure that they can be tiled. Ideally, this will be done with the Offset filter in Photoshop and with some redrawing or cloning to fix the remaining seams.

The SketchTone shader can be combined with the Cel Edges shader (also included in the NPR Kit) to create outlines around the forms and complete the hand-drawn effect. There are other shaders included in the kit, such as the Halftone shader, the Dab shader, the Toon shader and the Stipple shader. The Gooch shader enables you to apply one colour to your highlights and a different colour to the shadows, enabling for many palette effects.

Use a variety of custom shaders

There are quite a few preset SketchTone shaders provided with the NPR Kit, so with a little time and creativity you can create many more yourself. You don't necessarily need to stick to hatching or brushstrokes either, so you could create SketchTone shaders comprised of little stylised skulls, doodled rings, loops, fingerprints or any number of other ideas.

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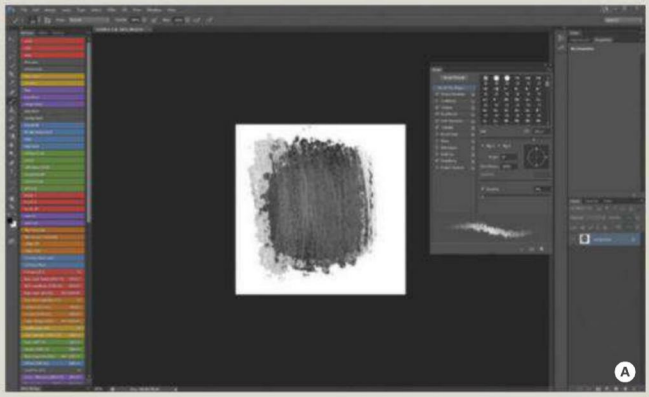
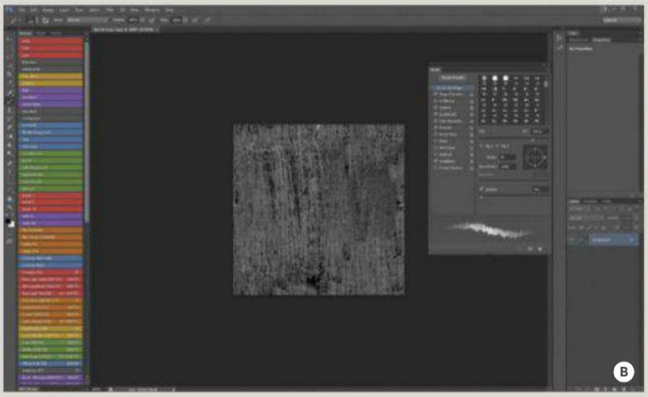
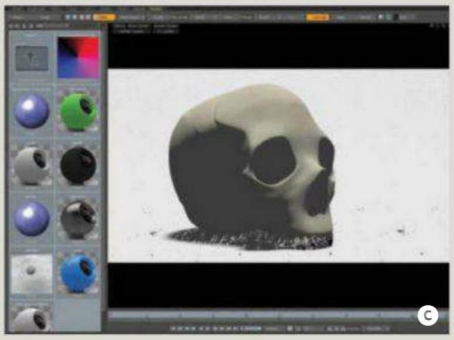
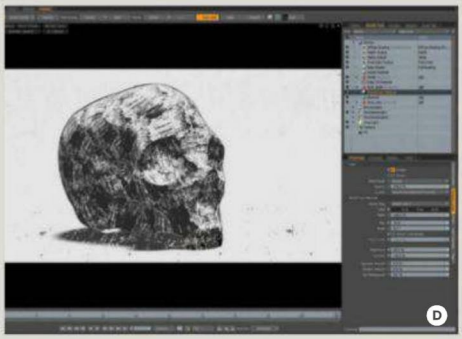




01 Create the shader

In Photoshop, start a new document at 512 x 512 pixels, and then make a custom brush with rough edges. In the Color Dynamics section of the Brush palette, set the Foreground and Background Control to Pressure. This will give you a painterly brush that will modulate between black and white depending on how hard you press. You'll find the brush used here has been supplied with this issue. Using this brush, fill your canvas with strokes going up and down A.





02 Fix the seams

With the basic shader painted (alternatively drawn, scanned or sampled) we now need to create a seamlessly tiling version for use in modo. Because of the hand-drawn nature of these, it's best to do this manually rather than using automated methods (although Painter users might be able to use the Pattern Maker to draw a tiling SketchTone shader). Use the Offset filter to place the seams in the middle of the canvas and paint over them with the custom brush B.

03 Set up the scene

In modo it's now a case of creating a suitable scene, in this case we will adapt one of the sample scenes that comes with the program (in the Samples folder, in the Organic subfolder) called skull.lxo. For NPR rendering it's best to turn GI off so there's a decent amount of contrast for the shadows. In this case we also disable the area lights and just use a simple direct light C.

04 Apply the SketchTone

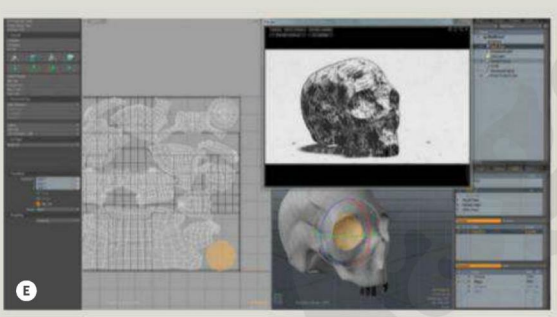
Once the scene is ready, the SketchTone can be added. Since it's used as a shader, you have the option of only applying to certain items or materials, or to the entire scene. With the UV option checked, it will follow the contours of the geometry according to the UV map. You can selectively edit the UVs by scaling or rotating individual UV islands to control the size and direction of the applied map D.

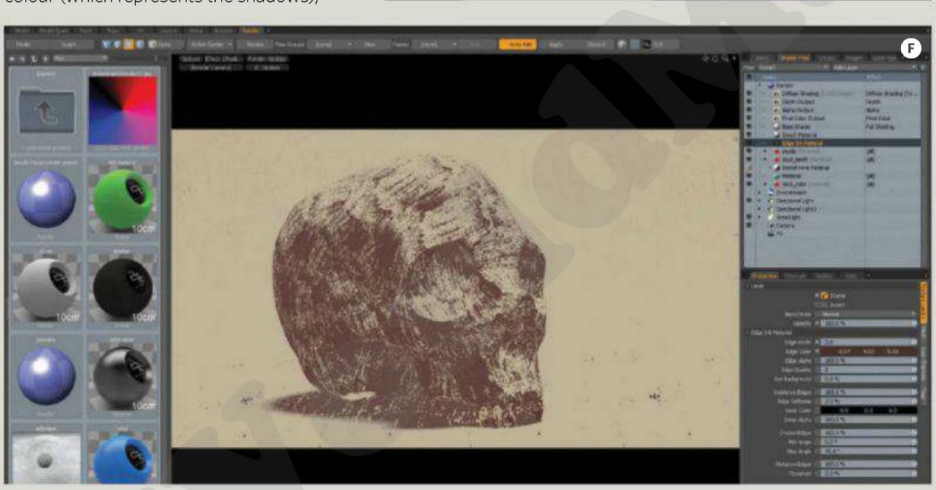
05 Make adjustments

With the SketchTone shader applied you will want to adjust the lighting in your scene. Move the lights around until they give a pleasing mix of light and shadow, then change the parameters of the SketchTone shader itself. The Tiling Amount, Angle, as well as the Brightness and Contrast controls are all very useful for organising this effect. If you would rather not use the UV Mapping option, you can simply tick the Screen Co-ordinates checkbox E.

06 Final touches

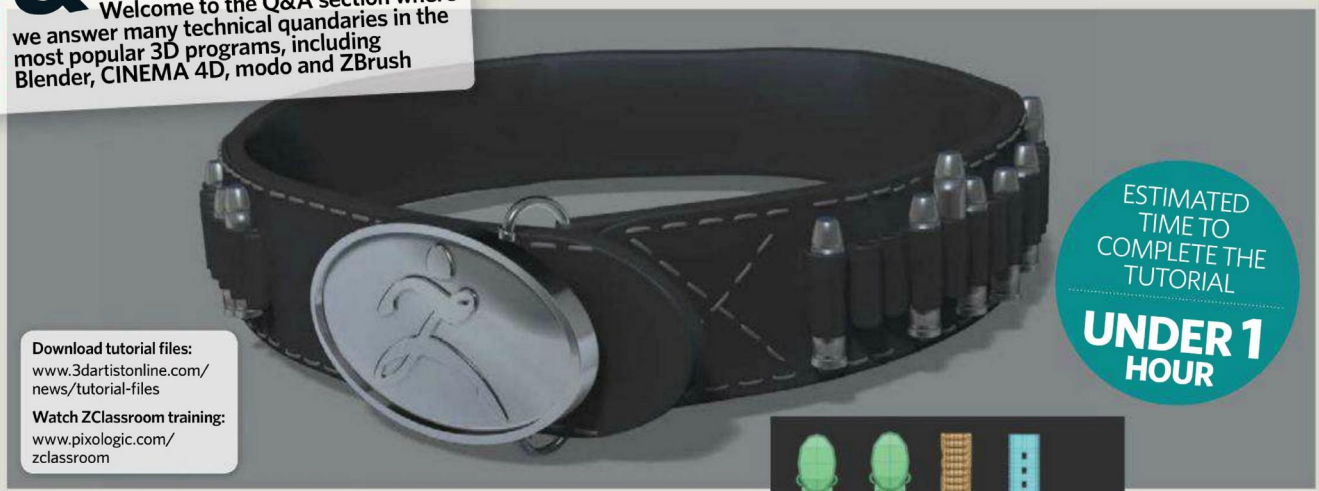
At this stage we add a Gooch shader to create the brown colour palette. The cool colour (which represents the shadows), should be a dark, reddish brown. The warm colour (which represents the lights) should be a much lighter beige-brown. We then tick the Use Lights option in the Gooch material for it to respect the scene lighting. You can optionally add a Cel Edges shader if you want an outline around the geometry F.





3DArtist Questions & answers

Welcome to the Q&A section where we answer many technical quandaries in the most popular 3D programs, including Blender, CINEMA 4D, modo and ZBrush



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Quick straps

ZBrush

How can I quickly create items like straps, belts or chains in ZBrush?

When approaching a complex item I'll always look to the simplest way to create the piece. Once I have my concept or idea established I begin to break that down into sections. This way I can focus on the whole piece in parts, instead of one sculpt.

When ZBrush 4R4 was released, the Insert Mesh capability – enabling any piece of geometry to be instanced along a curve – opened up many possibilities. With this addition, creating something like a belt became a very simple process.

Start by thinking of how belts are manufactured. There's the buckle, the belt itself (is this more than one piece?) and any belt loops that will be needed to keep the belt in place.

With this in mind we'll construct a belt in three pieces: a buckle, the end of the belt and the middle section that will be repeated along a curve when the brushstroke is applied. However, we won't want the belt to have a repetitive look. By creating multiple middle sections of a belt, ZBrush enables us to create a brush with a western-themed bullet belt featuring limited signs of repetition. A western theme is one example, but of course there are a multitude of styles you could choose.

01 Set up your brush

First create a small belt with three PolyGroupss. The first PolyGroup is the end of the belt, the second is the middle section (this is repeated along the stroke) and the third is the belt buckle. Make sure that all three PolyGroups are the same relative height. With the belt facing the camera plane, click the Create Insert Multi Mesh button in the Brush palette and select CurveMode in the Stroke palette A.

02 Add unique details

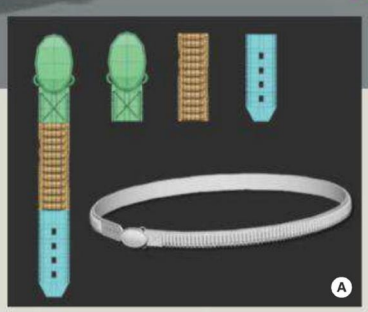
To get some variance, duplicate the original seven times and change the middle section for every duplicate. In Brush>Modifiers turn on Weld Points, turn up Curv Res, set Variations to 8 and the Variations Selector to 3. This is for randomness in the middle PolyGroup when the brush is used. To ensure the pieces weld, check each one has the correct opening and the vertex points match at the ends of each PolyGroup B.

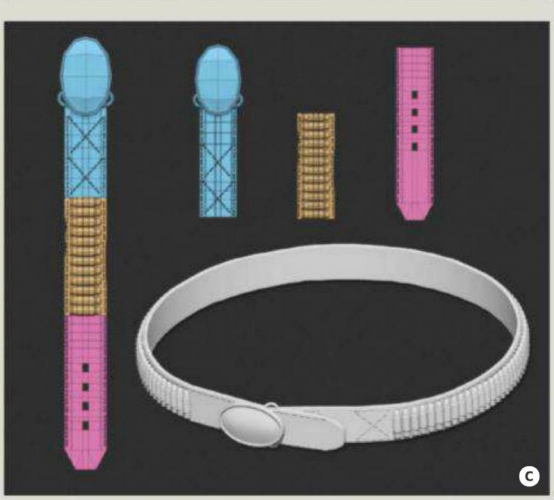
03 Close off the belt

Now we'll complete the belt. When the curve is drawn out we'll need to break the rule of making sure that all three PolyGroupss are around the same height. If you make the first and second PolyGroups larger, the belt will then be completely closed off when drawn out C.

Looping the whole curve around

If you want the curve to completely wrap around a surface, make sure you hold the Shift key and keep moving your brush outside of the mesh. You will see that ZBrush creates a complete curve around your mesh.





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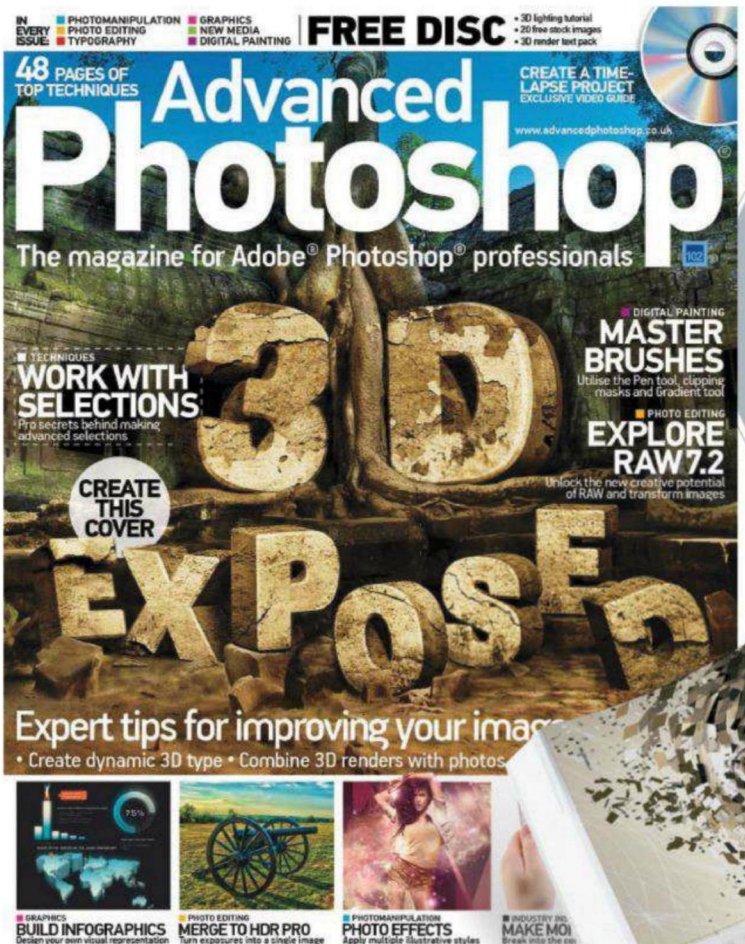

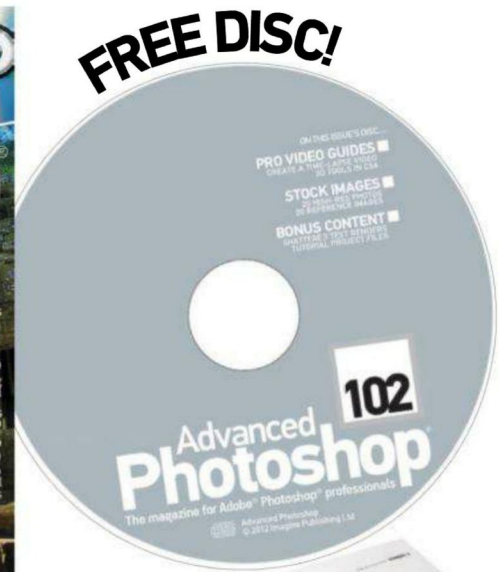

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Smoke 2013

A completely redesigned editing interface with powerful keying, colour correction, tracking and 3D compositing tools – all available directly from the timeline

At NAB 2012 Autodesk created a stir in the post-production industry with the re-introduction of its revamped editing and visual effects software, Smoke 2013.

Smoke has always been a powerful finishing tool and those who have used previous versions swear by the professional toolset that it provides. The major stumbling block in the software previously was that no matter how hard new users tried to get their heads around the interface, they struggled. The interface was just completely alien to anything else in the industry. Power was never an issue with Smoke, but its capacity to gain traction with new users was a problem for Autodesk.

Smoke 2013 changes that in a big way. The editorial interface no longer has an intimidating appearance, but a more friendly Mac-like experience, with an emphasis on the traditional editing layout that you would expect from such software as Final Cut Pro and Premiere Pro. There's even a list of keyboard shortcuts identical to Final Cut Pro 7 so you can jump in and begin editing quickly.

Presently, Autodesk is making Smoke 2013 freely available until mid-December through a free pre-release trial. This approach definitely benefits any potentially wary users new to the software. During the trial Autodesk is actively seeking ideas from users – what they like, what they don't, and how they personally think it can be improved.

Since June, users have seen four beta versions released, each one providing a significant update over the previous. There will most likely be another two releases between now and the end of the year, which can only be a good thing. Each new update has so far seen numerous enhancements, bug fixes and stability issues addressed.

So, what makes Smoke 2013 stand out from other non-linear editing applications? Simple: ConnectFX, the powerful node-based

The redesigned Smoke 2013 interface now has an improved, more familiar look

ConnectFX is Smoke 2013's advanced, node-based visual-effects workspace

compositing environment. Nothing new there, but with Smoke 2013 you have access to Autodesk's high-end keying, colour correction and true-3D compositing tools directly in your timeline. You no longer need to make a round trip to multiple effects applications. As the editor or visual-effects artist you now have the ability to start and finish the edit inside a single application.

Node-based compositing may seem foreign to those coming from an editorial background. However, Autodesk has tried to simplify this by providing hundreds of presets inside effect nodes in the ConnectFX compositing environment. Hopefully this is something that will become more user-friendly. It would make sense to also have access to these effects presets directly on the timeline without entering the advanced compositing environment.

Where the power of a connected editing and effects workflow takes over is inside the true-3D compositing environment. Smoke 2013 can import 3D objects, environments and camera data from a number of different formats. It has relighting and texturing tools that integrate with your imported 3D objects. So instead of heading back to your 3D software to relight and re-render your scene, you can modify, refine and enhance your scene directly with Smoke's powerful 3D compositing toolset.

The program has traditionally been found in the high-end post-production market, but the release of Smoke 2013 will see its visual-effects toolset opened up to a much wider audience. A reduction in price of over 70 per cent from the previous version means this editing and visual-effects powerhouse can be owned by the individual at the reduced price of £3,200 (ex. VAT) or $3,495 US.

The system requirements to run Smoke have also been dramatically lowered. The idea of running these high-end tools on a laptop just five years ago was unheard of; in 2013 it will become a reality.

The good & the bad

- ✓ A redesigned and more intuitive editing interface
- ✓ ConnectFX in the timeline
- ✓ 3D compositing and relighting tools
- ✓ Price reduced by over 70 per cent
- ✓ Greatly reduced system requirements means greater flexibility
- ✗ The program is still in beta development
- ✗ Basic filter effects need to be better integrated with the timeline
- ✗ Node compositing for new users takes a long time to learn

Essential info

Price: £3,200 (ex. VAT) / $3,495 US (MSRP)

http://usa.autodesk.com/smoke-for-mac

OPERATING SYSTEMS

- Mac OSX version 10.6.6 or higher

OPTIMAL SYSTEM REQUIREMENTS

- 4GB of RAM (8GB or higher recommended)
- 64-bit processor
- Minimum 1,440 x 900 display (1,920 x 1,200 or higher recommended)
- AJA KONA, KONA 3G, or IOxT Thunderbolt device for video I/O

Smoke 2013 is still a work in progress. Download the free trial until December and evaluate it to see if it suits your needs

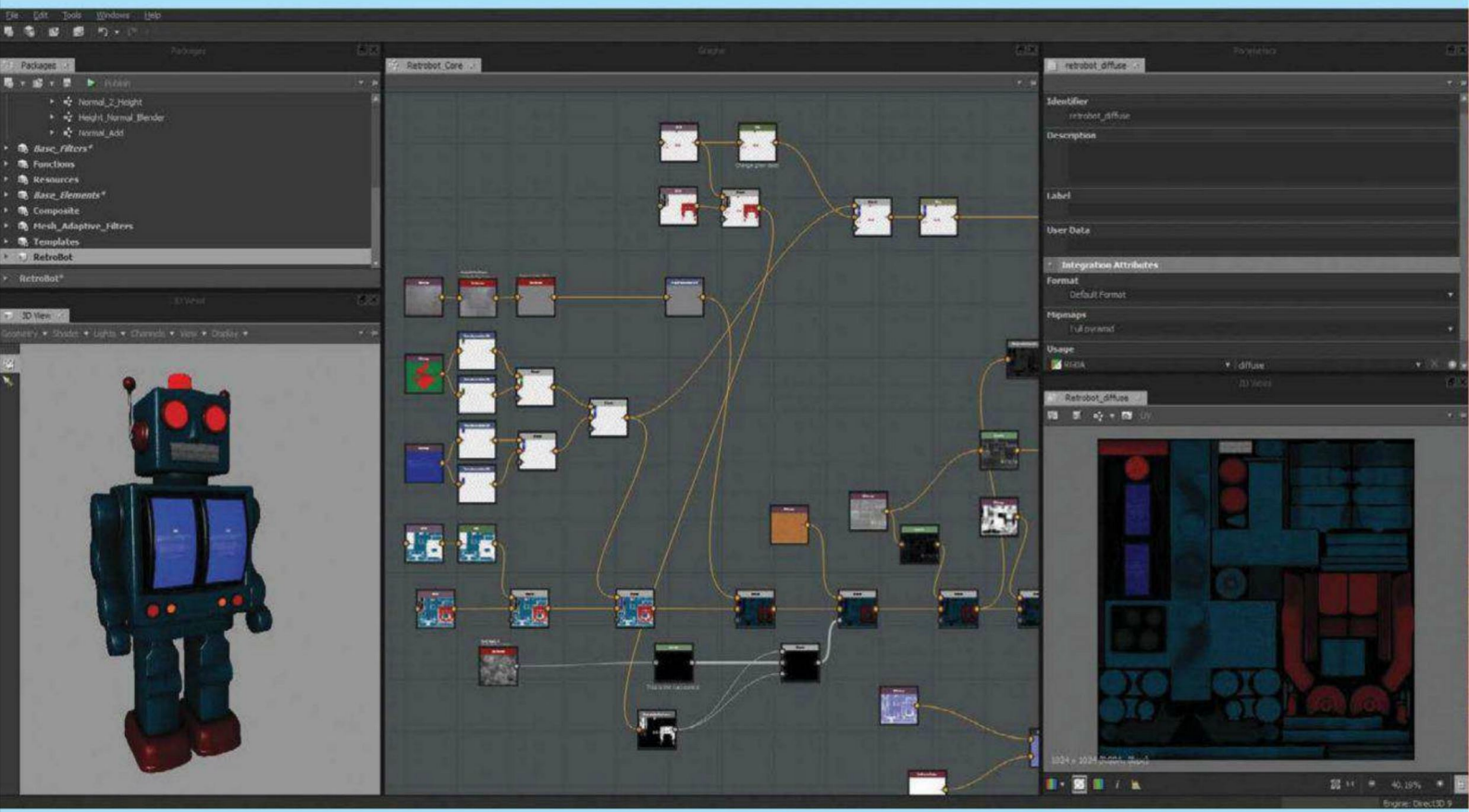
Our verdict

Features	9/10
Ease of use	8/10
Quality of results	10/10
Value for money	9/10

"A high-end visual-effects toolset combined with an intuitive editing interface. What's not to like?"

Final Score 9/10

Workflow



The Substance Designer 3 interface is highly customisable and a pleasure to work with

Substance Designer 3

$590 US Are smart textures the future? We take a close look at the latest version of the non-linear texture-creation software from Allegorithmic

To say that the latest incarnation of Allegorithmic's Substance Designer is powerful would be an understatement. This parametric texture generator is an extremely powerful piece of software and features a toolset every 2D and 3D artist should explore. Not only will its node-based interface change the way you generate your textures, but its linear, multi-output and non-destructive workflow will definitely speed up your art pipeline. Gone are the days when one small change to a texture meant you would have to adjust all the other associated textures manually, as all the changes you make to a node in Substance Designer 3 will affect all its outputs/channels.

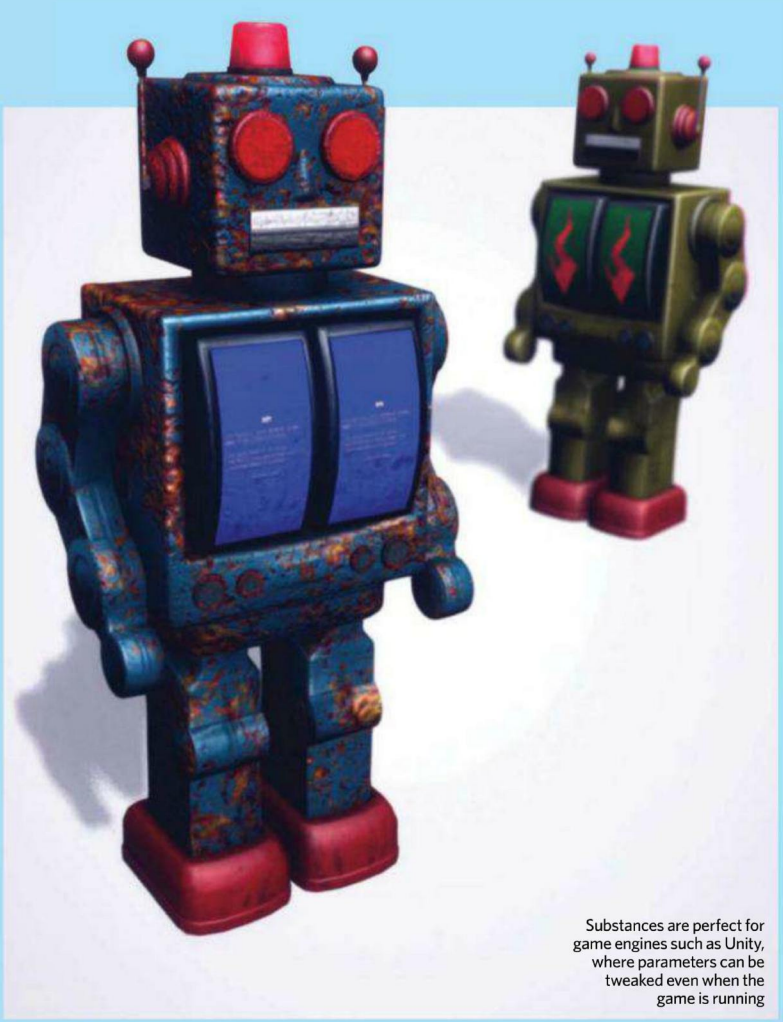
With its dark-grey interface, which most CG applications seem to love these days, Substance Designer 3 sure looks a bit overwhelming at first. However, an inviting Welcome screen quickly points you to all the necessary beginner tutorials and samples.

The interface itself is quite self-explanatory and consists of five main areas that can be moved around and tweaked to your own liking. The Packages window is basically where you create new graphs and functions, import resource files and publish your substances. Either Ctrl/right-clicking or hitting Spacebar when in the Graph Editor creates the nodes of the graphs. The Parameters window is where the attributes of individual nodes are set. Here you can also control various Output settings for your node trees and exposed node parameters will be shown here. These exposed parameters are embedded into the generated substance file, which can then be tweaked inside the material editor of various 3D programs, or in game engines such as Unity or UDK.

The 2D view isn't only for viewing, but also for painting textures and masks either by using brushes or vector tools. The Brush Editor is quite extensive and comes with a vast library of pre-made brushes, but you can also save your own presets. Support for tablets is implemented to a certain degree, with various Brush settings affected by pen pressure. The vector tools are just as impressive, giving access to all the tools necessary to do precise drawing or masking work on your projects.

The 3D view on the other hand is what it claims to be and gives you access to a handful of basic models for previewing, but it can also load custom meshes. This view is updated instantly and, using a common set of shaders, will give you a good visual indication of the final output.

Another great feature in Substance Designer 3 is its ability to extract texture information from 3D models. Not only does it bake Curvature, Ambient Occlusion, Position and World Space Normal maps, but its ability to convert UV maps into Vector maps is a godsend. This makes masking out areas of



Substances are perfect for game engines such as Unity, where parameters can be tweaked even when the game is running

The good & the bad

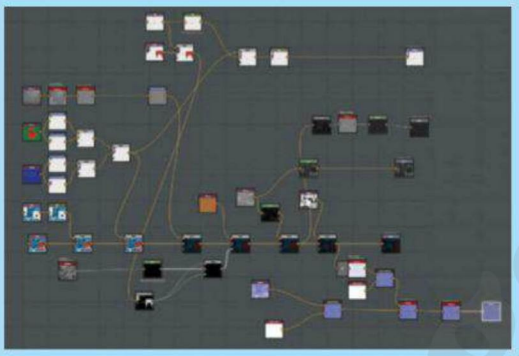
- ✓ Rich feature set
- ✓ Very stable
- ✓ 2D and vector painting
- ✓ Useful texture baking from 3D models
- ✓ Batch tools
- ✗ Slight learning curve
- ✗ No batch tools GUI
- ✗ Currently no way to save GUI layouts

Essential info

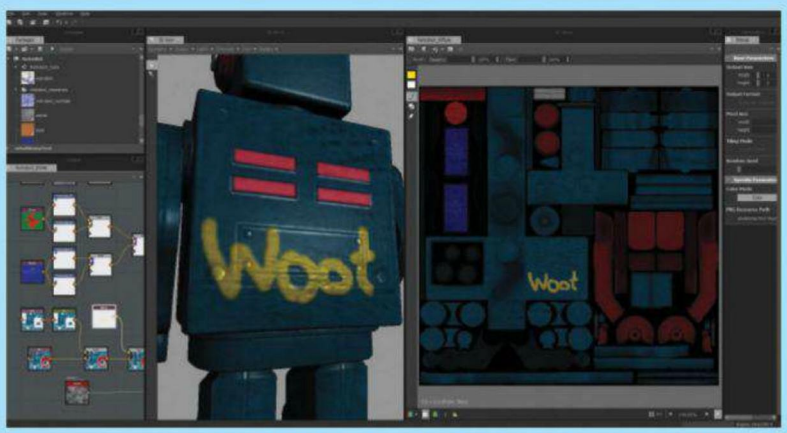
Price: $590 US
www.allegorithmic.com

OPERATING SYSTEMS
- Windows XP, Vista and 7
- Mac OSX 10.6 and higher

OPTIMAL SYSTEM REQUIREMENTS
- CPU: X86 with SSE2
- RAM: 2 GB - 4GB recommended
- Video Memory: 512MB minimum
- GPU: DX9 - DX10 - Shader Model 3.0



Node trees in Substance Designer 3 can become quite large, but the ability to combine and reuse nodes will save time and space in the Graph view



The built-in 2D paint system makes other 2D applications redundant for the most part

your texture very quick and really speeds up the workflow. Combining these generated maps with the vast library of procedural noises, patterns and effects that ships with the program, the possibilities for texture generation are almost endless.

Also boosting your workflow is a batch of tools that comes included with the program. These are basically a collection of small programs that automate the process of generating, modifying and exporting substances and bitmaps. These batch tools can also be used by external 3D apps via scripting and will no doubt save a lot of time for your larger pipelines.

Substance Designer really flexes muscles in its latest version and comes packed with an enormous toolset that would require a lot more than these pages to cover. If you can overcome the slight learning curve, though, this program will most likely be able to take your textures to new heights.

Our verdict

Features	9/10
Ease of use	8/10
Quality of results	10/10
Value for money	10/10

> A robust and powerful texture tool that will change the way you work

Final Score 9/10

Workflow Class

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US readers turn to page 15

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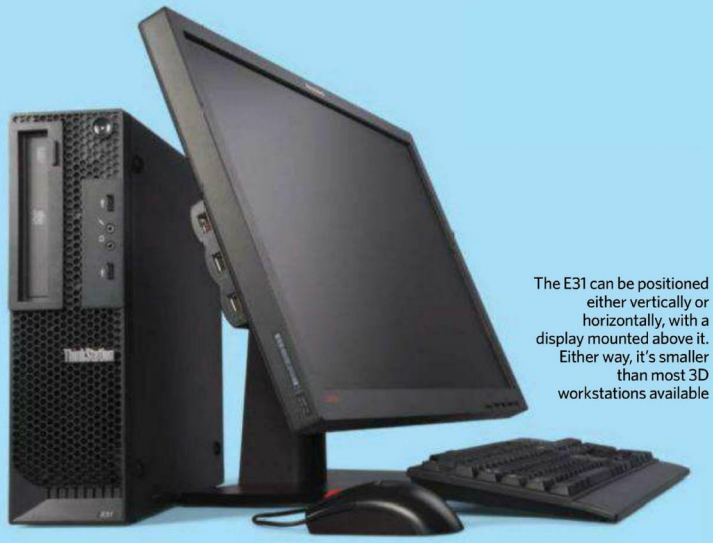
Lenovo ThinkStation E31 Small Form Factor

An unobtrusive, slim desktop workstation that offers plenty of performance for the modest creative



The E31 can be positioned either vertically or horizontally, with a display mounted above it. Either way, it's smaller than most 3D workstations available

What it lacks in the 3D grunt of full-sized workstations, the E31 makes up for in customisation options – although some of these are pricey

Small form factor (SFF) workstations are often better suited for word processing and editing spreadsheets than running 3D software. Their limited internal space restricts them to weedy power supplies, providing poor airflow to dissipate the heat from busy components.

Lenovo's ThinkStation E31 is a notable exception, as it's a half-height SFF computer that can be configured with hardware that's more than capable of tackling design software and modest rendering tasks. It includes an Intel Xeon processor and NVIDIA Quadro graphics card and is small enough to be kept out of the way and placed directly underneath a display. This makes it suitable for use in offices where a full-sized tower workstation is impractical.

We were sent a customised E31 with a 3.5GHz quad-core Intel Xeon E3-1270 – the most powerful available for the SFF variant – along with an NVIDIA Quadro 600. It came with a 1TB internal hard disk, with room to add another if required, along with 4GB of DDR3 memory.

Lenovo sells the ThinkStation E31 in a standard tower chassis too, which has more flexible customisation options, including space for a third 3.5-inch hard disk and the possibility of a more powerful graphics card.

A Quadro 600 is the best option available for the SFF model, though, as it's one of the few that can offer respectable 3D performance and still fit inside a half-height workstation. However, this is limited when compared with the capabilities of larger cards. In SpecViewPerf's range of 3D tests, the E31's scores were roughly half what the Quadro 2000-equipped entry-level workstations managed last issue.

The Xeon E3-1270 is a relative powerhouse, though: it ripped through CINEBENCH with a score of 7.4, placing it on the same level as Intel's Core i7 3770K desktop processor. It also outperformed it in a 3ds Max render, which relies heavily on processor performance.

The ThinkStation E31 comes with a media card reader, optical drive (with Blu-ray as an option) and a wide array of connectors at the rear, including four USB 3 ports, DVI and Displayport. The 4GB of memory is paltry for a workstation, but more can be included. Extra components for the E31 (such as a 256GB SSD) costs far more than their off-the-shelf price, which can make this slim workstation rather expensive.

Given the choice, we'd much rather use a full-sized workstation over an SFF model, but not everyone has that luxury. Although the E31 won't be breaking any performance records, it runs design software perfectly well, which is quite an accomplishment given its small desktop footprint.

Our verdict

Price: From £868*
www.lenovo.com

Features	7/10
Ease of use	8/10
Build quality	8/10
Value for money	6/10

> Respectable if not record-breaking performance means the E31's small size enables design work in the smallest of office spaces

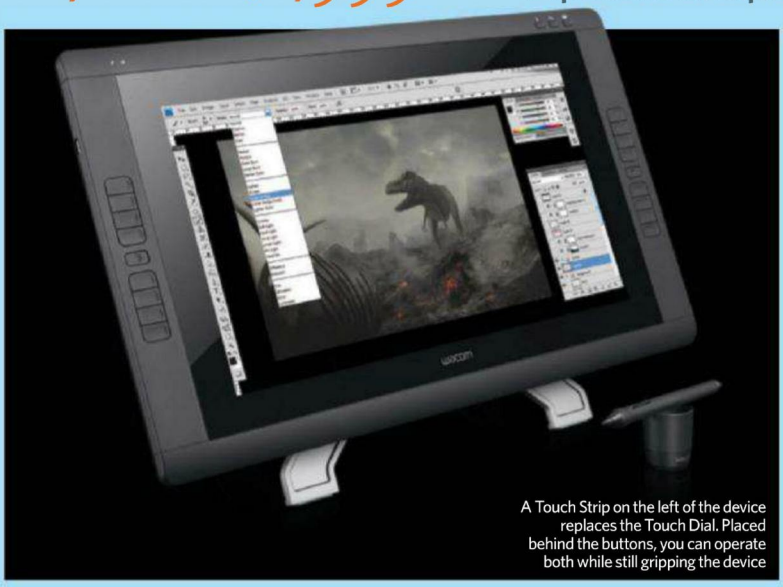
Final Score 7/10

*Price provided by ThinkLogic, **www.thinklogic.co.uk**

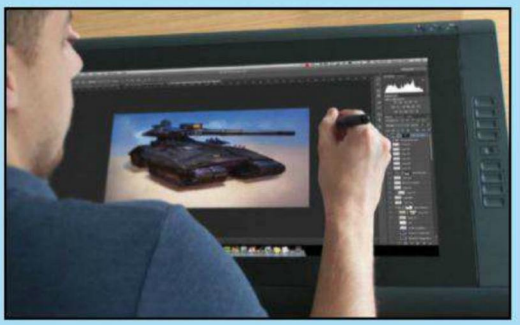
Cintiq 22HD Interactive Pen Display

£1,600 / $1,999 US

Explore the features of the latest entry to Wacom's impressive Cintiq range for creative professionals



A Touch Strip on the left of the device replaces the Touch Dial. Placed behind the buttons, you can operate both while still gripping the device



The Touch Strip toggle button is central, letting you choose operations for the Touch Strip. Using this you can easily scroll/zoom, cycle through layers, adjust image size and rotate the canvas

The Cintiq 22HD Interactive Pen Display's ergonomic features provide increased comfort and productivity

The Cintiq 22HD Interactive Pen Display may not look hugely different from its predecessor, the Cintiq 21UX. However, its unparalleled screen responsiveness, along with a host of upgrades, brings whole new meaning to the term 'interactive'. Here, Wacom has created as immersive and personal a creative experience as possible.

The new Cintiq 22HD Interactive Pen Display offers users an impressive 1,920 x 1,080 full HD resolution, coupled with an industry-standard 16:9 aspect ratio – far better than its predecessors at only 4:3. This offers truly first-rate image clarity.

Colour dispersion is impressive too, with the device boasting 16.7 million colours. For the average consumer this may mean little, but at an impressive eight bits per colour, digital professionals looking for on-screen accuracy can get excited about the prospect of true-to-life tonality.

Digital artists will also be pleased to learn that the Cintiq 22HD includes a 1,000:1 contrast ratio – the highest in the new Cintiq range. We witnessed no pooling of shadows or highlights when performing our Photoshop tests, which is great news for matte painters working with cinematic lighting, for instance.

At a depth of just over two inches, the Cintiq 22HD is not just more appealing to design-conscious consumers, but the lighter weight (compared to the Cintiq 24HD touch) has enabled Wacom to revert back to the rotational stand, rather than utilise the usual ergo stand. The device's slimmer size makes rotation and manoeuvrability much more fluid. Turning and folding the device, enabling you to find and set more leisurely positions, creates the sensation of working with traditional media, such as a sketch pad.

The Cintiq 22HD also sees an upgrade in pen pressure, now registering at an improved 2,048 pressure-sensitivity levels and an impressive 60 degrees of tilt sensitivity – akin to the Intuos5 drawing tablets. These make digital brushes extremely responsive, leading to noticeably authentic results.

The Cintiq 22HD even goes so far as to anticipate brushstrokes. Hover the stylus 6mm above your screen, move it and you'll see the cursor is ready to roll even before pressure has been applied. As soon as you put pen to display your brushwork translates into smooth and fluid marks.

Photoshop users will find the application very familiar, too, when using Mixer brushes and the new CS6 Erodible Tip and airbrush tools. The latter disperses authentically once you ease off the pressure, as you would expect in real-word scenarios. When working with soft brushes and layers in post-production, there was no lag when continuous strokes were applied.

It's where application meets ergonomics that you begin to truly appreciate what Wacom has achieved. The Cintiq 22HD's technological enhancements have enriched creative interaction on a more personal level.

Our verdict

Features	8/10
Ease of use	10/10
Build quality	10/10
Value for money	8/10

> Wacom's latest device will help you express your ideas even further, while the improved entry price makes it easier on the pocket

Final Score 8/10

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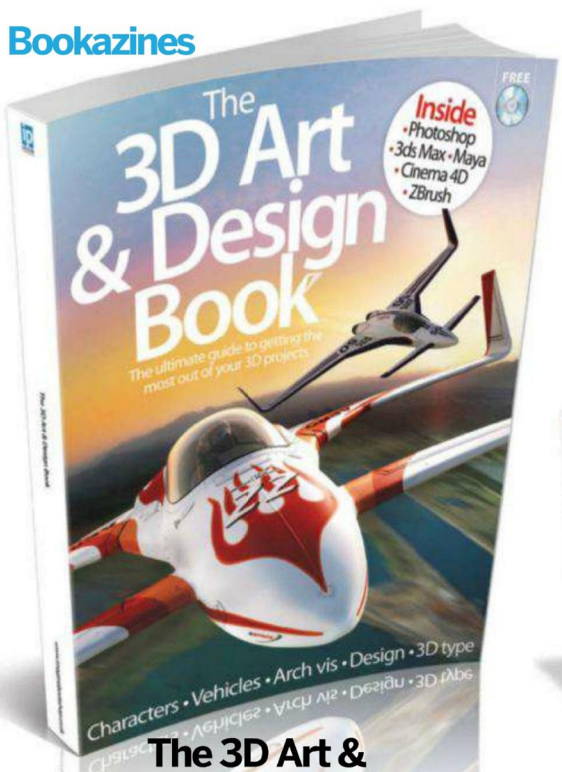
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workspace 3D

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inside

Growing Together
The announcement that The Foundry and Luxology are to merge shook the industry. We spoke to key people from each studio to ascertain exactly what this means going forward www.thefoundry.co.uk

Image courtesy of Clive Biley **www.parkerbiley.com**

"The more we can help artists to be artists and not technicians then the more productive they become and the better their work. That top-level goal is something that we will be chasing after"

Luxology's president of the Americas Brad Peebler discusses the future of the merger with VFX specialists The Foundry.
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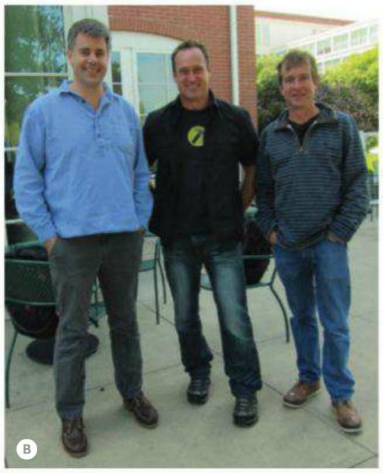

Luxology and The Foundry merge

The Foundry chief scientist Simon Robinson and Luxology co-founder Brad Peebler discuss the new venture

A There will be little change to either company for the time being. This is due to customer relationships and the fact that both companies have commitments over the coming months and years that they don't wish to interfere with

B One reason the merger came to be was the simple fact that the teams get on. "There's a great cultural fit between the companies," says The Foundry chief scientist Simon Robinson

C "The next big step is to go back to the customers," explains Robinson. "We need to validate what they want rather than throwing out a bunch of wild and wacky ideas"

D The use of modo in the videogames industry opens some exciting new possibilities for The Foundry. This is especially true considering that some of MARI 1.5's features aim specifically at that growing and lucrative market

E Could a new digital tool similar to Photoshop be in the works?

The announcement that The Foundry and Luxology have joined forces sent shockwaves across the 3D world. We spoke to Simon Robinson and Brad Peebler to find out more.

Why are Luxology and The Foundry such a good fit?
Simon Robinson: It's a combination of many different things. The most important thing is we all just get on together, so from [the] point of view of the teams... there's a great cultural fit between the companies.

On the commercial side there's very little product overlap between us, but we both serve the same markets. The Foundry has great strength in the VFX market, but the one thing it has never really reached into is anything to do with 3D modelling, animation and rendering. Getting access to this kind of stuff from Luxology is really wonderful because we have a bunch of clients we can reach out to with modo.

So it's a combination of all those things. It's the cultural fit, the nice jigsawing together of these different product lines and also the extended market that one side brings to the other.

> "modo has such a great focus on how an artist interacts with the software. It's very much a focus on the art and what the artist needs to make"
> **Simon Robinson,** The Foundry chief scientist

So we'll see a change to The Foundry's pipeline?
Simon Robinson: Yes, clearly it extends the parts of the pipeline that can be reached. I think that's interesting for us and obviously... for customers.

Will we also see modo used more as a VFX tool?
Brad Peebler: modo is used in VFX but it's not as widespread as it could be. We do have case studies

How did it happen?

The idea for the merger was first proposed by ILM VFX supervisor and avid modo user John Knoll during a meeting. For Peebler, Knoll's professional pipeline experience along with his personal status as a 3D enthusiast personifies the merger. "It's that blend of pipeline knowledge and artist-friendly philosophies that we're bringing together in the merger. Combining those two core competencies is going to have the largest impact on the industry as we move forward."

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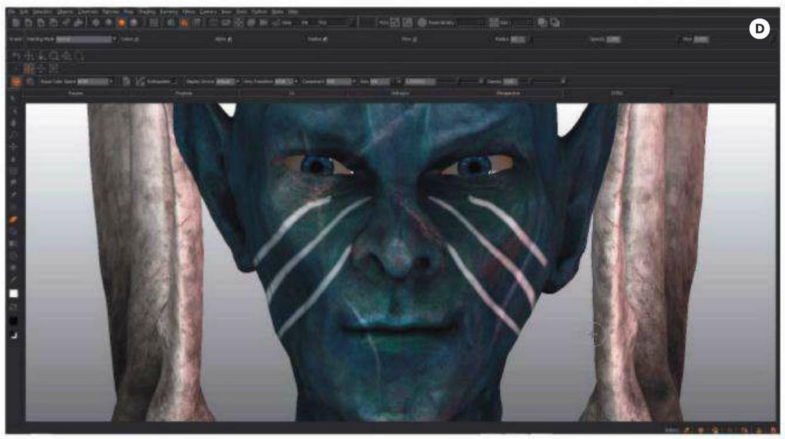


New product?

While The Foundry and Luxology have hinted at the possibility of a new tool, nothing has yet been set in stone. Our guess is that the two companies may very well be working on a Photoshop-style tool, one tailored directly to the VFX/3D art community rather than a broader catchall artist's tool. The Foundry's work on MARI could feed into this, and it's worth noting that John Knoll – who proposed the concept of the merger – was also one of the original creators of Photoshop.

with Pixar and ILM and the like but it's typically not coming from the top-down but from the bottom-up – which is to say it is typically brought into studios at the artist level. It's a space we had intended to grow into but this merger essentially offers a chance to get right into it. The merger is an obvious growth opportunity for us. That said, there is a lot of talking we need to do with our customers to ensure that modo... continues to grow into something that's relevant and specific for that market.

Can we expect completely new tools from the collaboration?

Simon Robinson: There is huge potential for this... I'd hesitate to say putting new things together is 'easy', because then all our engineers would shoot me, but it is entirely possible. We kicked off very early on this and at the moment we don't want to go into specifics about what the joint operation will produce, but obviously we'd like to roll something out in the not-too-distant future. From the very first point that we had these conversations we've had engineering collaborations on a joint product. The enthusiasm on both sides for the way both companies work has made that project go extremely well. I think that was what also gave us the encouragement and confidence, which going ahead with the full merger would actually pan out for us.

Can you discuss any long-term goals?

Brad Peebler: One thing that we have been clear about internally and we will chase as a philosophy is that we want to combine the core competencies of artist-friendly workflows with robust industrial-strength pipeline tools. This is a concept that resonates not only in the VFX world, but across all of our industries. The more we can help artists to be artists and not technicians, then the more productive they become and the better their work [is]. That... goal is something that we'll be chasing.

Read the full interview with Robinson and Peebler at tinyurl.com/3DArtistMerger.

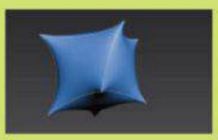
Software shorts

Bringing you the lowdown on product updates and launches

Blender 2.64

The Blender Foundation has released Blender 2.64, the latest entry into its open-source software package, this time offering the full VFX pipeline. Blender 2.64 features camera tracking, object and planar tracking, advanced greenscreen keying, a new mask editor for rotoscoping, a new compositing system and rendering improvements. You can learn more at Blender.org, or go to www.tearsofsteel.org to see the latest Blender film created using this release.

TurboSmooth Pro



3ds Max expert Marius Silaghi has released TurboSmooth Pro, a modifier plug-in for 3ds Max that is designed to produce "nice, smooth, semi-sharp creases on your models, unlike the ugly creases that the standard TurboSmooth [modifier] does". The plug-in enables artists to control creases by edge weights or smoothing groups, rather than contending with the irritation of placing support loops. Visit www.mariussilaghi.com.

HDR Light Studio 4

Lightmap has released HDR Light Studio 4, a major update to its innovative image-based lighting software that enables artists to create synthetic HDRI maps, or edit existing HDRI files, and see the results applied to their 3D scenes in real-time. New features include the addition of LightPaint technology, which enables artists to click directly on the rendered view to position virtual light sources around the 3D model. Visit www.hdrlightstudio.com for more.

Insightful snippets

A free Student version of MAXON's CINEMA 4D R14 is released

© Bastien Grivet

MAXON has revealed CINEMA 4D R14 Student, the free educational version of its popular 3D package. CINEMA 4D Student generously offers almost the full feature set of the $3,695 Studio edition of the software. However, it lacks support for network rendering and plug-ins that are dependent on serial numbers. "MAXON remains committed to providing students and educators with easy-to-use 3D software tools," said MAXON CEO Harald Egel. "We are pleased to offer students this comprehensive introduction to the world of 3D and help them deliver professional results in the real world." Licences last for 18 months and you can claim your copy at tinyurl.com/Cinema4DStudent.

A look to the future

SIGGRAPH Asia returns to Singapore for its fifth outing

From 28 November to 1 December, SIGGRAPH Asia returns to its inaugural city of Singapore for the fifth edition of the Eastern-based trade show. This year speakers include 'the father of MP3' Kerlheinz Brandenburg, co-founder of PDI/DreamWorks Richard Chuang and The Symposium on Apps returns for a second year with content from Microsoft, Tsinghua University and more. Along with this comes the Special Sessions program, offering presentations on the work behind the likes of *The Dark Knight Rises*, *Prometheus* and the ever-inspiring Technical Papers program.

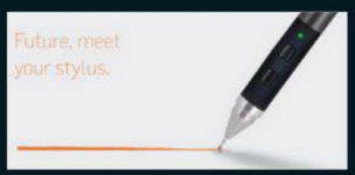
The first SIGGRAPH Asia was held in Singapore in 2008. Over the years since it's been held in China, Korea and Japan

New tools

A new pen set to revolutionise your tablet-sketching habits

Jot Touch

It's been out since the summer, but this new tablet stylus is catching on in the artist community in a big way, offering a new and intuitive way to sketch while on the go. The precision disc on the tip of the stylus covers enough surface area for a capacitive screen to respond to touch, but enables you to see where your precise mark will be made. Pressure sensitivity means that the Jot Touch creates more accurate interpretations of your strokes, while a dampening tip lessens the sound made when making contact with the screen for an experience, simulating the natural contact of pen on paper. You can get your hands on one now for $100 from **http://adonit.net**.



The Jot Touch also has two shortcut buttons on its side, enabling the artist to switch to Eraser or Undo with the flick of a finger

"Opinion"

Educational animation

Hinge Digital breathes life into a Carrington College ad campaign

Director Alex Tysowsky discusses making a successful animated campaign in a competitive market

Alex Tysowsky www.hingedigital.com

"Ad agency BVK recently enlisted our team to create an integrated, animated ad campaign for Carrington College including broadcast spots, online outtakes, print ads, plush toys, Twitter avatars and more.

"The agency provided an initial creative brief, but gave us the freedom to design and animate the characters and environments from start to finish. We conceptualised, designed and animated Goldie and Blue: birds that represent career mentors and squirrels, symbolic of the student body – who are all featured throughout various pieces of the campaign.

"In the first :30 TV spot introducing Goldie and Blue, the birds encourage the Carrington College Squirrel to take a leap of faith and join other squirrels in a neighbouring tree. With no [dialogue] for the spot, our character design and animation had to drive the narrative. The success of the entire campaign hinged on [the studio's] ability to breathe life into these characters and visually convey the story...

When creating characters for the campaign, Hinge had to consider how they would be used across various media

"Gathering a team of 30... we worked on multiple pieces of the campaign over a three-month period: concepting, storyboarding, character design, animation, VFX, editing and more. Our team overcame a number of complex animation challenges to ensure these characters stood out – adapting design elements along the way to ensure they would work across all facets of the campaign."

> "The success of the entire campaign hinged on [the studio's] ability to breathe life into these characters and visually convey the story"
>
> **Alex Tysowsky,** Hinge Digital director

Congratulations to...

Pixomondo wins big for Game of Thrones visuals

Pixomondo artists were recently awarded the Outstanding Special Visual Effects honour at the Creative Arts Emmy Awards, received for its outstanding work on *Game of Thrones*' season two finale, 'Valar Morghulis'. As the primary VFX provider for the entire season, Pixomondo completed from 60 to over 140 VFX shots for each of the episodes. "This has been an incredible year for Pixomondo artists," exclaimed company CEO Thilo Kuther. "First the Oscar for *Hugo* and now the Emmy for *Game of Thrones*!"

Game of Thrones' VFX are often so well hidden they're nearly indistinguishable, with set extensions looking as natural as if they were real locations

Animal Logic buys Fuel VFX

Australian company now operating as Animal Logic Fuel

ANIMALLOGIC

Animal Logic CEO Zareh Nalbandian announced last month that the VFX company has finalised a deal to buy the business assets of studio Fuel VFX, which recently went into voluntary administration. Fuel VFX will now operate as Animal Logic Fuel out of Newtown, Sydney. "Fuel VFX represents some of Australia's best design and visual-effects talent and capabilities," says Nalbandian. "Highly regarded around the world for its advertising and film VFX work, it is a name with a great pedigree and a solid future. We are committed to making sure that this great creative resource will not disappear from our Australian VFX landscape."

Course Focus

3D I

Develop your 3D skills at The Art Department, the "next-generation model for art education"

Course name
3D I
Course length 16 weeks
Fees $1,300
Website
www.theartdepartment.org

The Art Department was set up in 2009 by the founders of the award-winning Illustration Academy (www.illustrationacademy.com) and leading art education portal ConceptArt.org. The partnership between the two organisations has led to them offering programs that merge real-world and online training.

One such course is 3D I, an online class that teaches the basics of 3D modelling and texturing with the primary tools utilised in the 3D industries – Maya, ZBrush, the Wacom tablet and Photoshop.

Available individually, for part-time TAD students, or as an elective for full-time attendees, the 3D I course sees students focus on the foundation skills and processes used to produce 3D content for both personal and professional work.

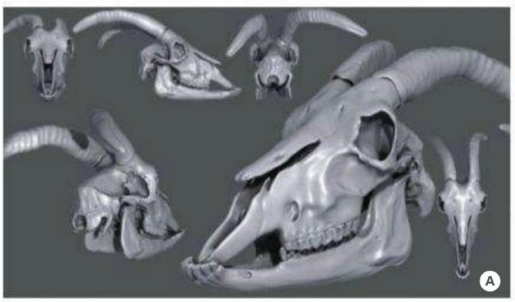
The class begins with hard surface modelling, with students learning the root skills needed to sculpt and model in 3D, unwrap meshes and create believable, photoreal surfaces through hand-painted shaders. At the end of the course students will be able to create hard surface objects such as props and vehicles, as well as gain a foundation in developing characters, creatures and other organic forms using high-resolution sculpting and digital painting tools. Students also learn peripheral skills, such as how to present work as if they were dealing with art directors or using the latest remote production tools.

"My mentors were able to teach me the lessons between the lines of my textbooks," says TAD's RVA studio director and ex-student Sterling Hundley. "The application of this knowledge has allowed me to graduate from their student to their peer." Learn more about the course at www.tinyurl.com/TD3DI.

> "It's the most up-to-date, concise information available on an ongoing basis from award-wining artists working in the trenches"
> **Anita Kunz,** The Art Department faculty

The tutor

Brett Briley
Brett Briley works as a 3D modeller, texture artist and concept artist, designing textures, normal maps, models and concepts. Past projects include videogames such as *Age Of Empires III*, *The Elder Scrolls IV: Oblivion*, *Dungeon & Dragons Online* and *Halo Wars*. He also teaches character modelling and hard surface modelling classes at the Art Institute of Dallas. More examples of his work can be seen at **www.bbriley.com**.



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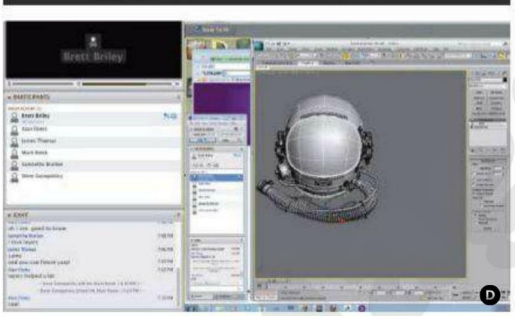


D

E

A *Goat Skull* 2012
» Alan Flores
Upon completing the course, students will have a solid understanding of how to model intricate shapes, such as the impressive skulls presented here

B *Motorcycle* 2012
» Miles Wadsworth
There's a big focus on hard object modelling during the 3D I course. Students will come out at the end with an enhanced ability to create vehicles like this motorbike

C *Cop Car* 2012
» Steve Gonopolsky
Students don't just learn the craft of 3D art, they also explore how to successfully develop and present their work to potential clients or creative directors

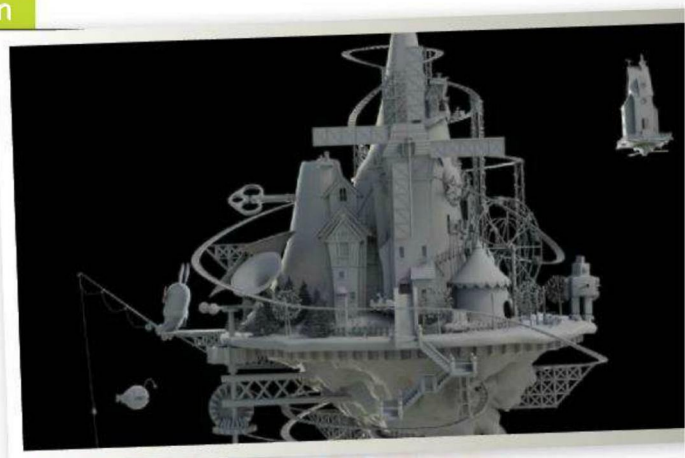
D Virtual classroom
All classes at TAD are taught live, giving students the opportunity to interact with their instructors and classmates, participating in the lecture or demonstration in real-time

E Workshop
TAD has three studio locations in Austin, TX, Kansas City, KS and Richmond, VA, where TAD's full-time students have access to a fully equipped studio space

Studio Access

Milky Tea World

Milky Tea discusses how it condensed its varied past works and bright aesthetic style into one colourful diorama



milkytea

Formed in 2005, this Liverpool-based studio offers digital illustration, animation and interactive production with an aim to support the advertising and entertainment industries. It has worked with some of the world's most renowned brands, including Sony, BBC and Lloyds TSB. It was recently nominated for BAFTA and Emmy awards.

www.milkytea.com

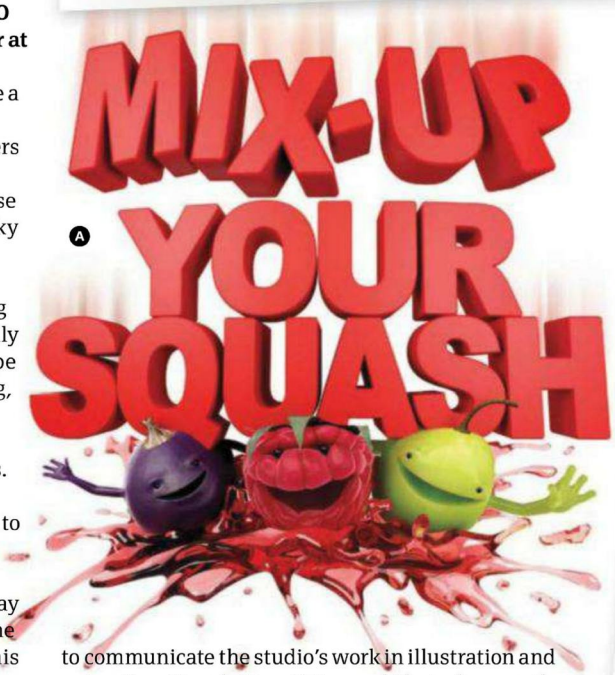
Project Milky Tea World
Description Milky Tea World is the culmination of the studio's past work in one bright and colourful image. Featuring characters and environments from various past projects, but uniting them through the airy, buoyant and fun-filled tone that personifies Milky Tea's output, it's the perfect way for the company to announce to its audience "this is who we are!"
Country UK
Client Internal project
Software used 3ds Max, V-Ray, Photoshop

Creative production studio, Milky Tea, was founded in 2005 by just two designers – CEO Jonathan Holmes and his business partner at the time, Ian Leyand – but has evolved over the years into something much larger. "We now have a team of around 20 exceptionally talented visual storytellers, digital artists, animators and designers skilled in the areas of gaming, entertainment and advertising," says Jonathan Holmes. It's this diverse skillset and wider knowledge that has helped Milky Tea become what it is today.

The studio has worked with many top clients across the world over the past seven years, ranging from Sony and Channel 4 to Lloyds TSB on its readily recognisable 'For The Journey' campaign. "The type of work we create is always diverse and interesting, designing everything from bespoke character mascots for world-renowned brands and mobile games through to photorealistic CGI," says Holmes. "We're, in a word, playful! We don't just make characters, we also make magical worlds for them to play in and it's that attention to detail that sets us apart from our competitors."

Case in point: Milky Tea World. "We wanted a way to show the journey we've been on, and decided the most inspiring way to do this would be to create this world and fill it with many of the characters and projects we've created over the last seven years," explains Paul Kelsall, senior 3D generalist. "Everything about it is who we are, where we've been and what we've done."

Milky Tea World is to be utilised in a variety of marketing material both in still and animated forms to communicate the studio's work in illustration and animation. "As 3ds Max, V-Ray and Photoshop are the backbone to our pipeline, these applications are where most of the work was done," says Kelsall. "Most of the modelling was done in 3ds Max, although for some of the more complicated elements ZBrush and Mudbox were used. If a job requires more organic modelling, then we will use ZBrush for



Contributors

Jonathan Holmes
CEO

Paul Kelsall
Senior 3D generalist

> "We try to keep our work looking clean, fresh and vibrant... It's the little things in an image or animation that make them great" **Jonathan Holmes, CEO, Milky Tea**

Portfolio highlights

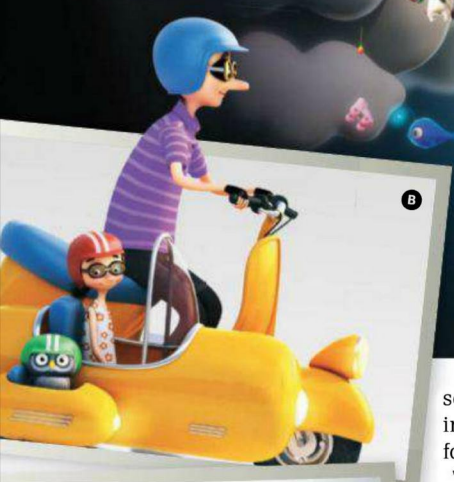
Here are some of the campaign projects Milky Tea has worked on:

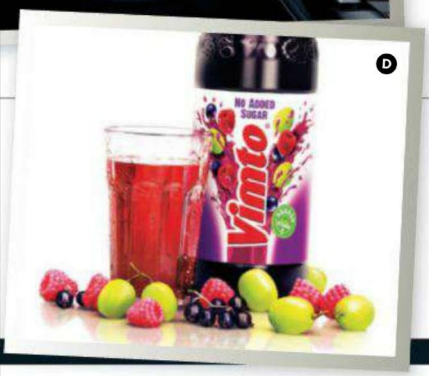
2012 BOSE product CGI and animation
2012 Vimto campaign
2011 Clarks interactive window
2011 SSE Online
2011 *Fairy Platinum Pinball* game
2011 Lloyds TSB *Westfield* illustration
2010 NHS flu campaign
2009 BBC *The Well Cross* flash game
2007 Lloyds TSB 'For The Journey' campaign

workspace

To submit your project to the **workspace** please contact Chris McMahon at **chris.mcmahon@imagine-publishing.co.uk**

"The materials are all V-Ray models. More complex ones would have their own channel textures for controlling diffuse, specular, reflection, refraction, bump and displacement. This allows us to re-create materials more efficiently"





sculpting anything from character's faces to creases in car seats, while we use Mudbox from time to time for painting textures with more complex geometry.

"The lighting is based on a simple three-point rig, with the help of a painted HDRI used as a texture in a V-Ray Dome light," he continues. "There isn't any GI used in the scene at all. This was important to keep our render times to a minimum..."

Kelsall says working on the project has enabled the team to better manage complex scenes and deal with thousands of objects, such as with CAD scenes. "The sheer number of objects in the scene made managing them quite difficult. We used 3ds Max's layers system to group all of the different parts together, so that they could be hidden more easily to ensure better navigation around the scene.

"Having an understanding of where things are in your scene really helps, and having a logical way of working allows anyone in the studio to pick up your scene and work with it. This is really beneficial on bigger jobs that require more artists to ensure deadlines are met."

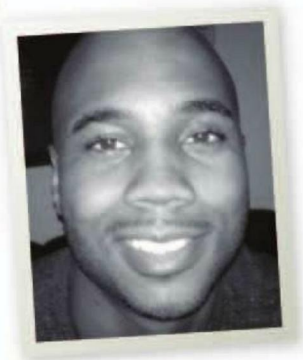
So, what does the future hold in store for Milky Tea? "The coming year will be an exciting one for everyone involved," concludes Holmes. "There are exciting developments, especially the announcement of our dedicated games division, Milky Tea Play, which launched in September. Our photorealistic work will also see us branching out into previously uncharted territory. We're all feeling pretty energised by the opportunities on offer in the next 12 months!"

A As well as creating colourful still images, Milky Tea also utilises compositing tools like Nuke for its recently expanded animation output. "Node-based compositing is definitely the most straightforward way to colour correct animation."

B "We are probably best known for our Lloyds TSB characters. This is a relationship we have had for five years now. To date we have created over 1,000 digital illustrations and 60% of all the graphics and interactive content for its 'For The Journey' campaign"

C "We have worked with some of the world's biggest brands, agencies, TV production companies and game developers including BBC, Kleenex, Sony, Clarks, Unilever, Channel 4, SSE, NHS, Rainey Kelly, Rufus Leonard and Proximity"

D Milky tea uses a range of tools to create its professional results. "Recently we've used CGI to create photorealistic products for drinks brand Vimto. We've also produced photorealistic work for Bose, creating CGI of its products before they hit the shelves"



Industry insider

Wayne Hollingsworth

Senior visual effects technical director

We sat down for a chat with Wayne Hollingsworth to discuss the creation of lifelike particle eLects

About the insider

Job Senior visual eLects technical director

Location Los Angeles

Education Masters in Computer Animation and VFX, Digital Media Arts College, Boca Raton, Florida

Company website www.waynart.com

Biography While he didn't initially target a position in the VFX industry, Wayne Hollingsworth has nevertheless ended up a veteran in the field. Working for the likes of Luma Pictures, Sony and Digital Domain, the now-freelance VFX TD has titles such as Thor, Battle Los Angeles and numerous advertising campaigns in his portfolio.

An atypical background for someone breaking into the visual effects industry, along with an open approach to selecting software helps Wayne Hollingsworth stand out in the VFX crowd. While he didn't start out looking to be a technical director, it's where he's ended up. He used his skills with Houdini, Maya, 3ds Max and other software packages to create the impressive visuals we've seen in summer blockbusters such as The Amazing Spider-Man and Thor.

Viewing his showreel – hosted on Vimeo at tinyurl.com/whollingsworth – you'll find a great deal of particle, smoke, water, snow and other naturalistic effects. Judging by their quality, it's clear to see why the man is in such demand in Hollywood and the world of advertising.

He backs up this ability with a modesty and level-headedness that is somewhat surprising for someone who has worked on such huge projects so soon after breaking into the industry. But it's from keeping his feet firmly on the ground and maintaining a strict work ethic that success has followed – as Hollingsworth says: "Dedication and hard work is the key." Not bad for a kid from Brooklyn who wasn't even looking to get into the VFX industry.

There are a lot of different effects in your work: particle, water, smoke, destruction – what are the different demands for each?

Each element has particular demands. Looking at real-life reference is vital when I go about achieving a certain effect. Focusing on behaviours, forms and light interaction is important as well. Once I go through this process I then move forward in trying to perfect the element I am making.

Do you think you have perfected any particular effect? If so, which one?

No, as an FX artist you may never perfect an element. The goal is to try and come close. Currently I don't personally think I have perfected an element.

Are there any specific effects you prefer to work with over others?

All these elements are fun and challenging to work with. If I had to [choose just one], I would have to say that making aerodynamic and destruction elements are my favourite.

What is their appeal?

Smoke and demolition effects [particularly] appeal to me because there is nothing cooler than seeing an explosion or a building destroyed with the use of FX on the big screen. There's always that wow factor that the audience experiences.

What's your educational background? Were you always aiming for a career in VFX?

My educational background is very interesting – I didn't target the industry at first, but once I decided to enquire and pursue it I worked extremely hard and became very passionate about it. I graduated from Indiana University with my Bachelors of Fine Arts, and I later went back to school to Digital Media Arts College in Boca Raton, Florida, to receive my Masters in Computer Animation and VFX.

Do you think people need a college/university qualification to break into the industry?

I think education is vital for the learning experience. An artist cannot get this if [they choose] to learn FX [alone]. With that being said, it is still possible to be successful and break into the industry if self-taught. There is a vast amount of learning material online that [you] can use to become a senior-level FX artist. Most importantly – whatever road [you choose] to take, dedication and hard work is the key.

Portfolio highlights

Some recent features that Wayne Hollingsworth has worked on:

2006 Coca-Cola Happiness Factory: Psyop
2009 Wrigleys Gum Commercials: MPC
2010 Infiniti Commercials: Digital Domain
2011 Thor: Luma Pictures
2011 Battle Los Angeles: Luma Pictures
2011 Once Upon a Time: Zoic Studios
2012 The Amazing Spider-Man: Sony Pictures Entertainment

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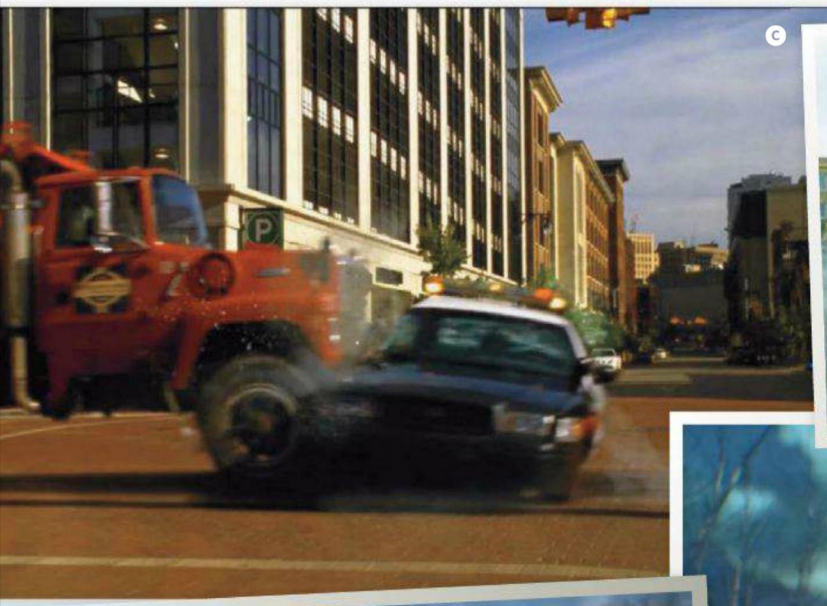
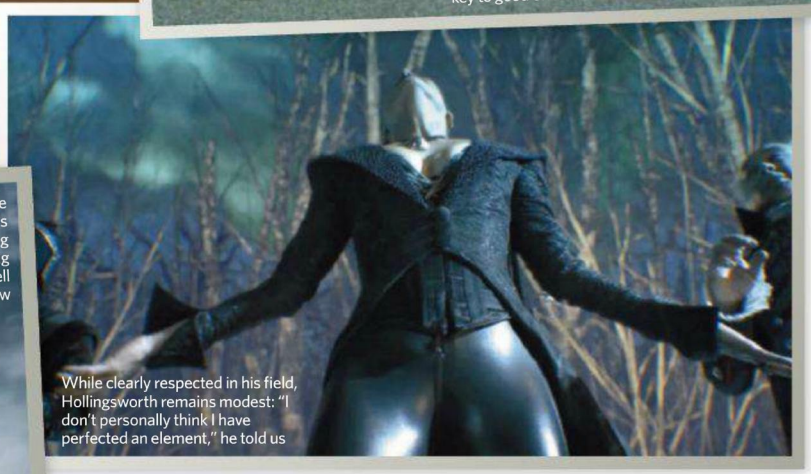


Looking at how things function – or happen – in real life is key to good effects work, according to Hollingsworth

Effects work is one of the VFX pipeline's most demanding elements, requiring mathematic as well as artistic know-how



While clearly respected in his field, Hollingsworth remains modest: "I don't personally think I have perfected an element," he told us

It's all net

It isn't just those who pursue a career in visual effects early on that manage to break into the industry, as Hollingsworth's story shows

Hollingsworth's journey to the world of VFX came via a route you probably wouldn't expect. He played basketball semi-professionally while growing up in Brooklyn, New York. In his own words "playing and training was a constant grind", so he headed back to school – and the rest is history.

While working at Sony, Hollingsworth used Houdini – but his portfolio stretches to include the likes of Maya, 3ds Max and others

> "There is nothing cooler than seeing an explosion or a building destroyed with the use of FX on the big screen"

A The ability to deal with last-minute changes to carefully laid plans is what defines a truly talented VFX artist, according to Hollingsworth

B Hollingsworth has worked on a few superhero movies and has helped to blow up, confuse and generally cause trouble for the A-list stars on the screen

C "There is nothing cooler than seeing an explosion or a building destroyed with the use of FX on the big screen." Or cars, obviously

D Effects that deal in destruction range from huge explosions and devastating car crashes through to simpler elements, like a smashing light

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UNLEASH YOUR IMAGINATION

Bruce Heinlein

Q: Did you have any 3D software experience before coming to the DAVE School?
A: No, not at all. My background was mostly graphic design.

Q: How has your experience at the DAVE School been so far?
A: It has been great, I have learned so much in such a short period, it has also opened up a whole new level of possibilities for my creative side.

Q: Tell me about this Model?
A: This was created in less than a week. It was our second week project.

Q: Wow! Did you think that you would be able to create something like this in your second week of school?
A: Absolutely not! When the instructor showed us the reference material, my jaw dropped! I'm glad that I decided to come to the DAVE School, and look forward to what I can do next.

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